POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO
COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Department Of Computer Science And Engineering

Program Name: B.Tech

Faculty Name: Dr. A.Rama Devi

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	I-I	ENGLISH-I	R161101	18/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
57 Hours	Theory 4	Practical 3	3	Internal 30	External 70	3

Programme Outcomes:

	Program Outcome
PO1.	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
Not-selected as the course does not address any of these aspects.	
PO2.	**Problem analysis**: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Not-selected as the course does not address any of these aspects.	
PO3.	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
Not-selected as the course does not address any of these aspects.	
PO4.	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
Not-selected as the course does not address any of these aspects.	

PO5.	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
Not-selected as the course does not address any of these aspects.	
PO6.	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
Not-selected as the course does not address any of these aspects.	
PO7.	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
Selected as the course addresses knowledge domain for sustainable development	
PO8.	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
Not-selected as the course does not address ethical issues .	
PO9.	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
Selected as the course addresses the importance of teamwork and leadership qualities.	
PO10.	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
Selected as the course addresses the importance of communication skills and effective presentation.	
PO11.	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
Selected as students can understand how to manage projects in multidisciplinary environment	
PO12.	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
Selected as student can recognize the need for life-long learning.	

Programme Specific Outcomes:

PSO1	Practices of mathematical ideas: By using mathematical techniques to solve problems using appropriate

	mathematical study, data structure and algorithms.
Not-selected as the course does not address any of these aspects.	
PSO2	Practices Of Computing: The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
Not-selected as the course does not address any of these aspects.	
PSO3	Practices of Software Development: By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and plat form independent skills
Not selected as the course does not address any aspects.	

Course Objectives:

1. To learn the skills of grammar

2. To communicate in English very clearly and effectively

Course Outcomes:

CO1: Develop knowledge in different fields and serve the society accordingly.

CO2: Develop listening skills to communicate effectively.

CO3: Improve comprehension skills.

CO4: Improve fluency of speech

CO5: Develop English language reading skills

CO6: Develop writing skills

ENGLISH-I
(Common to all Branches)

ENGLISH FOR ENGINEERS AND TECHNOLOGISTS, Published by **Orient Blackswan Pvt.Ltd.**

NON-DETAILED TEXTBOOK:

PANORAMA: A COURSE ON READING, Published by **Oxford University Press India**

UNIT I:

1. 'Human Resources' from English for Engineers and Technologists.

2. 'An Ideal Family' from Panorama: A Course on Reading

UNIT 2:

1. ' Transport: Problems and Solutions' from English for Engineers and Technologists.

2. 'War' from 'Panorama : A Course on Reading'

UNIT 3:

1. 'Evaluating Technology' from English for Engineers and Technologists.

2. 'The Verger' from ‘Panorama: A Course on Reading'

UNIT 4:

1. 'Alternative Sources of Energy' from English for Engineers and Technologists.

2. ' The Scarecrow' from Panorama: A Course on Reading

UNIT 5:

1. 'Our Living Environment' from English for Engineers and Technologists.

2. 'A Village Host to Nation' from Panorama: A Course on Reading

UNIT 6:

1. ' Safety and Training' from English for Engineers and Technologists.
2. 'Martin Luther King and Africa' from Panorama: A Course on Reading

Program Name: B.Tech (LAB) **Faculty Name: Dr. A.Rama Devi**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	I-I	ECS-I	IR161114	18/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
33 Hours	Theory 4	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

	Program Outcome
PO1.	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
Not-selected as the course does not address any of these aspects.	
PO2.	**Problem analysis**: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Not-selected as the course does not address any of these aspects.	
PO3.	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
Not-selected as the course does not address any of these aspects.	
PO4.	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
Not-selected as the course does not address any of these aspects.	

PO5.	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
Not-selected as the course does not address any of these aspects.	
PO6.	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
Not-selected as the course does not address any of these aspects.	
PO7.	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
Selected as the course addresses knowledge domain for sustainable development	
PO8.	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
Not-selected as the course does not address ethical issues .	
PO9.	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
Selected as the course addresses the importance of teamwork and leadership qualities.	
PO10.	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
Selected as the course addresses the importance of communication skills and effective presentation.	
PO11.	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
Selected as students can understand how to manage projects in multidisciplinary environment	
PO12.	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
Selected as student can recognize the need for life-long learning.	

Programme Specific Outcomes:

PSO1	Practices of mathematical ideas: By using mathematical techniques to solve problems using appropriate

	mathematical study, data structure and algorithms.
Not-selected as the course does not address any of these aspects.	
PSO2	Practices Of Computing: The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
Not-selected as the course does not address any of these aspects.	
PSO3	Practices of Software Development: By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and plat form independent skills
Not selected as the course does not address any aspects.	

Course Objective:

To communicate in English very clearly and effectively

Course Outcomes:

CO1: Develop LSRW Skills to communicate effectively.

SYLLABUS: ENGLISH COMMUNICATION SKILLS LAB – I

UNIT 1:
Why Study Spoken English
Making Inquiries on Phone
Responding to Thanks
Practice Work
UNIT 2:
Requests, Permissions, and Directions
Practice Work
UNIT 3:
Clarifying, Inviting, Complaining, Congratulating and Expressing Sympathy
Apologizing, Advising, Suggesting, Agreeing and Disagreeing
Practice Work
UNIT 4:
Letters and Sounds
Practice Work
UNIT 5:
The Sounds of English
Practice Work
UNIT 6:
Pronunciation
Stress and Intonation
Practice Work

Program Name: B.TECH **Faculty Name: A.BINDU MADHAVI**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	I-I	APPLIED PHYSICS	R161104	18/06/2018

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical 6	3	Internal 30	External 70	3

OBJECTIVES: Physics curriculum which is re-oriented to the needs of Circuital branches of graduate engineering courses offered by JNTUniv.Kkd. That serves as a transit to understand the branch specific advanced topics

The courses are designed to:

• Impart Knowledge of Physical Optics phenomena like Interference, Diffraction and Polarization involving required to design instruments with higher resolution.

• Teach Concepts of coherent sources, its realization and utility optical instrumentation.

• Study the concepts regarding the bulk response of materials to the EM fields and their analytically study in the back-drop of basic quantum mechanics.

• Understand the physics of Semiconductors and their working mechanism for their utility in sensors.

OUTCOME:

Construction and working details of instruments, that is Interferometer, Diffractometer and Polarimeter are learnt. Study EM-fields and semiconductors under the concepts of Quantum mechanics paves way for their optimal utility

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PS01	Produce graduates who will demonstrate skills required to communicate, collaborate and continue to learn effectively as ethically and socially responsible computer science and engineering professionals.
PS02	Produce graduates who will be employed as Computer Science & Engineering professionals who serve beyond entry level positions in industrial/R&D organizations and/or be making satisfactory progress in higher degree programs in national/international repute institutes.
PS03	Predict the changing direction of information technology and evaluate and communicate the likely utility of new technologies to computer science and engineering professionals.

SYLLABUS

UNIT-I

INTERFERENCE: Principle of Superposition – Coherent Sources – Interference in thin films (reflection geometry) – Newton's rings – construction and basic principle of Interferometers.

UNIT-II

DIFFRACTION: Fraunhofer diffraction at single slit - Cases of double slit, N-slits & Circular Aperture (Qualitative treatment only)-Grating equation - Resolving power of a grating, Telescope and Microscopes.

UNIT-III

POLARIZATION: Types of Polarization – Methods of production - Nicol Prism - Quarter wave plate and Half Wave plate – Working principle of Polarimeter (Sacharimeter). LASERS: Characteristics– Stimulated emission – Einstein's Transition ProbabilitiesPumping schemes - Ruby laser – Helium Neon laser.

UNIT-IV

ELECTROMAGNETIC FIELDS: Scalar and Vector Fields – Electric PotentialGradient, Divergence of fields – Gauss and Stokes theorems-Propagation of EM waves through dielectric medium.

UNIT-V

QUANTUM MECHANICS: Introduction - Matter waves – Schröedinger Time Independent and Time Dependent wave equations – Particle in a box.

FREE ELECTRON THEORY: Defects of Classical free electron theory –Quantum Free electron theory - concept of Fermi Energy

UNIT-VI

BAND THEORY OF SOLIDS: Bloch's theorem (qualitative) – Kronig – Penney model – energy bands in crystalline solids – classification of crystalline solids– effective mass of electron & concept of hole. SEMICONDUCTOR PHYSICS: Conduction – Density of carriers in Intrinsic and Extrinsic semiconductors – Drift & Diffusion – relevance of Einstein's equation- Hall effect in semiconductors

	Course Outcome	POs/ PSOs	CL	Class Sessions (approximate)	Tutorial (Hrs)	Lab Sessions (Hrs)
CO1	**Identify** the principles and concepts of Interference observations in daily life, Construction and working details of optical instruments based on concepts of Interference.	PO1,PO2 PO6,PO7 PO8,PO9 PO10,PO12 PSO1,PSO2	**Apply (K3)**	10	1	6
CO2	**Identify** the diffraction due to different obstacles , resolving powers of optical instruments . Construction, working details of the optical instruments based on concepts of diffraction	PO1,PO2 PO6,PO7 PO8,PO9 PO10,PO12 PSO1,PSO2	**Apply (K3)**	10	1	6
CO3	**Identify** the concepts of polarization and lasers and Construction, working details of the Ruby, He-Ne lasers	PO1,PO2 PO6,PO7 PO8,PO9 PO10,PO12 PSO1,PSO2	**Apply (K3)**	12	1	0
CO4	**Explain** the concepts of vector and scalar fields, Propagation of E.M. waves in dielectrics	PO1,PO2 PO6,PO7 PO8,PO9 PO10,PO12 PSO1,PSO2	**Understand (K2)**	10	1	3
CO5	**Explain** the concepts and equations of matter waves in quantum mechanics and Explain different Electron theories of metals.	PO1,PO2 PO6,PO7 PO8,PO9 PO10,PO12 PSO1,PSO2	**Understand (K2)**	10	1	6

CO6	**Analyze the** band theory of solids, energy band formation and concepts of semiconductor physics	PO1,PO2 PO6,PO7 PO8,PO9 PO10,PO12 PSO1,PSO2	**Analyze (K4)**	12	1	12
Total Hours of instruction				64	6	39

Program Name: B.Tech **Faculty Name: SK.AREEF**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	I-I	MATHEMATICS-I	R161102	18/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	77	Internal	External	3

Programme Outcomes:

	Program Outcome
PO1.	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
Selected as application of knowledge of mathematics and science is involved in calculating troubles using advanced materials as engineering materials.	
PO2.	**Problem analysis**: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Selected as students can identify and analyze the problems of corrosion and can adopt new methods to overcome corrosion	
PO3.	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
Selected as the student can develop and construct the fuel cells and batteries.	
PO4.	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Selected as students are required to do experiments using electronic devices like conductometers, potentiometers.	
PO5.	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
selected as students learn the usage of modern tools and techniques for complex engineering materials like nanomaterials , liquid crystals, polymers.	
PO6.	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
selected as ,by the contextual knowledge of green chemistry, fuels etc student can assess societal, health and safety issues	
PO7.	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
Selected as the course address issues related to environment and sustainability.	
PO8.	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
Not-selected as the course does not address ethical issues .	
PO9.	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
Not selected as the course does not related.	
PO10.	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
Not Selected as the course does not address complex engineering activities with the engineering community.	
PO11.	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
Selected as students can understand how to manage projects in multidisciplinary environment	
PO12.	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in

	independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

selected as student can recognize the need for life-long learning in the context of technological change.	
PSO1	Produce graduates who will demonstrate skills required to communicate, collaborate and continue to learn effectively as ethically and socially responsible computer science and engineering professionals.
Selected as the course provides skills required to learn effectively as ethically and socially responsible engineering professionals..	
PSO2	Produce graduates who will be employed as Computer Science & Engineering professionals who serve beyond entry level positions in industrial/R&D organizations and/or be making satisfactory progress in higher degree programs in national/international repute institutes.
selected as the course addresses materials which serve Engineering professionals for making satisfactory progress in higher degree programs in national/international repute institutes.	
PSO3	Predict the changing direction of information technology and evaluate and communicate the likely utility of new technologies to computer science and engineering professionals
Not selected as the course does not address any aspects.	
PSO4	Ensure employability and career development skills through Industry oriented mini & major projects, internship, industry visits, seminars and workshops
Not selected as the course does not address any aspects.	

Course Objectives:

1. The course is designed to equip the students with the necessary mathematical skills and techniques that are essential for an engineering course.
2. The skills derived from the course will help the student from a necessary base to develop analytic and design concepts.

Course Outcomes:

* Apply first order and first degree differential equation to calculate orthogonal trajectories and current flow in a simple LR circuit.

* Discriminate among the structure and procedures of solving a higher order D.E with constant coefficients to calculate current flow in a simple LCR circuit.

* Apply Laplace transforms to solve ordinary differential equations

* Compute the Jacobians and Maxima and Minima (with constraints and without constraints) for functions of severable variables.

* Solve the partial differential equations of first order

* Solve the higher order Partial Differential Equations with constant coefficients

UNIT I : Differential equations of first order and first degree:

Linear- Bernoulli – Exact - Reducible to exact.

Applications: Newton's Law of cooling-Law of natural growth and decay-Orthogonal trajectories- Electrical circuits- Chemical reactions.

UNIT II: Linear differential equations of higher order:

Non-homogeneous equations of higher order with constant coefficients with RHS term of the type e^{ax}, sin ax, cos ax, polynomials in x, e^{ax} V(x), xV(x)- Method of Variation of parameters.
Applications: LCR circuit, Simple Harmonic motion.

UNIT III: Laplace transforms:

Laplace transforms of standard functions-Shifting theorems - Transforms of derivatives and integrals – Unit step function –Dirac's delta function- Inverse Laplace transforms– Convolution theorem (with out proof).

Applications: Solving ordinary differential equations (initial value problems) using Laplace transforms.

UNIT IV: Partial differentiation:

Introduction- Homogeneous function-Euler's theorem-Total derivative-Chain rule-Generalized Mean value theorem for single variable (without proof)-Taylor's and Mc Laurent's series expansion of functions of two variables– Functional dependence- Jacobian.

Applications: Maxima and Minima of functions of two variables without constraints and Lagrange's method (with constraints).

UNIT V: First order Partial differential equations:

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions –solutions of first order linear (Lagrange) equation and nonlinear (standard types) equations.

UNIT VI: Higher order Partial differential equations:

Solutions of Linear Partial differential equations with constant coefficients. RHS term of the type $e^{ax+by}, \sin(ax+by), \cos(ax+by), x^m y^n$

Classification of second order partial differential equations.

Program Name: B.TECH **Faculty Name: SD PARVEEN**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSA-A&B	I-I	Mathematics-II	R161109	18/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	55,53	Internal-30	External-70	3

Programme Outcomes:

	Program Outcome
PO1.	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
Selected as application of knowledge of mathematics and science is involved in calculating troubles using advanced materials as engineering materials.	
PO2.	**Problem analysis**: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Selected as students can identify and analyze the problems of corrosion and can adopt new methods to overcome corrosion	
PO3.	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
Selected as the student can develop and construct the fuel cells and batteries.	
PO4.	**Conduct investigations of complex problems**: Use research-based knowledge and research methods

	including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
Selected as students are required to do experiments using electronic devices like conductometers, potentiometers.	
PO5.	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
selected as students learn the usage of modern tools and techniques for complex engineering materials like nanomaterials , liquid crystals, polymers.	
PO6.	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
selected as ,by the contextual knowledge of green chemistry, fuels etc student can assess societal, health and safety issues	
PO7.	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
Selected as the course address issues related to environment and sustainability.	
PO8.	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
Not-selected as the course does not address ethical issues .	
PO9.	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
Not selected as the course does not related.	
PO10.	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
Not Selected as the course does not address complex engineering activities with the engineering community.	
PO11.	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
Selected as students can understand how to manage projects in multidisciplinary environment	
PO12.	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

selected as student can recognize the need for life-long learning in the context of technological change.	
PSO1	Produce graduates who will demonstrate skills required to communicate, collaborate and continue to learn effectively as ethically and socially responsible computer science and engineering professionals.
Selected as the course provides skills required to learn effectively as ethically and socially responsible engineering professionals..	
PSO2	Produce graduates who will be employed as Computer Science & Engineering professionals who serve beyond entry level positions in industrial/R&D organizations and/or be making satisfactory progress in higher degree programs in national/international repute institutes.
selected as the course addresses materials which serve Engineering professionals for making satisfactory progress in higher degree programs in national/international repute institutes.	
PSO3	Predict the changing direction of information technology and evaluate and communicate the likely utility of new technologies to computer science and engineering professionals
Not selected as the course does not address any aspects.	
PSO4	Ensure employability and career development skills through Industry oriented mini & major projects, internship, industry visits, seminars and workshops

Course Objectives:

1. 1. The course is designed to equip the students with the necessary mathematical skills and techniques that are essential for an engineering course.
2. The skills derived from the course will help the student from a necessary base to develop analytic and design concepts.
3. Understand the most basic numerical methods to solve simultaneous linear equations.

Course Outcomes:

CO1 Compare the rate of accuracy between Different methods in approximating a root of an equation.

CO2 Estimate the best fit polynomial for the given tabulated data using the methods of Newton's, Gauss and Lagrange's interpolation.

CO3 Solve an initial value problem involving an ordinary differential equation by using various numerical methods

CO4 Determine the Fourier coefficients in the Fourier series expansion of a given function in both Standard as well as arbitrary intervals.

CO5 Evaluate the solutions of heat, wave and Laplace equations.

CO6 Distinguish Among the three transformation techniques Fourier Transforms, Fourier cosine transforms and Fourier sine transforms.

UNIT I: Solution of Algebraic and Transcendental Equations:

Introduction- Bisection method – Method of false position – Iteration method – Newton-Raphson method (One variable and simultaneous Equations).

UNIT II: Interpolation:

Introduction- Errors in polynomial interpolation – Finite differences- Forward differences-Backward differences –Central differences – Symbolic relations and separation of symbols - Differences of a polynomial-Newton's formulae for interpolation – Interpolation with unequal intervals - Lagrange's interpolation formula.

UNIT III: Numerical Integration and solution of Ordinary Differential equations: Trapezoidal rule- Simpson's $1/3^{rd}$ and $3/8^{th}$ rule-Solution of ordinary differential equations by Taylor's series-Picard's method of successive approximations-Euler's method - Runge-Kutta method (second and fourth order).

UNIT IV: Fourier Series:

Introduction- Periodic functions – Fourier series of -periodic function - Dirichlet's conditions – Even and odd functions –Change of interval– Half-range sine and cosine series.

UNIT V: Applications of PDE:

Method of separation of Variables- Solution of One dimensional Wave, Heat and two-dimensional Laplace equation.

UNIT VI: Fourier Transforms:

Fourier integral theorem (without proof) – Fourier sine and cosine integrals - sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms.

Program Name: B.Tech **Faculty Name:** Anand Thota

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE – A & B	I-I	**COMPUTER PROGRAMMING**	R161107	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO2: Problem analysis:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

PO3: Design/development of solutions:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO4: Conduct Investigations of Complex problems:

Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1 Practices of mathematical ideas: By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.

PSO2 Practices of Computing: The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.

PSO3 Practices of Software Development: By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Objectives:

Student able to

1. Understand Notion of Operation of a CPU, Notion of an algorithm and computational procedure, editing and
2. Execute programs in Linux.
3. Understand branching, iteration and data representation using arrays.
4. Understand modular programming and recursive solution formulation.
5. Understand pointers and dynamic memory allocation.

Course Outcomes:

Student able to:

CO1: **Understand** the working of key components of a computer system.(K2)

CO2: **Describe** the fundamental programming constructs and articulate how they are used to develop a program with a desired runtime execution flow.(K2)

CO3: **Identify** the right control statements based on the problem statement.(K3)

CO4: **Understand** procedural oriented programming using functions.(K2)
CO5: **Distinguish** homogenous and heterogeneous data types(K4)
CO6: **Illustrate** the concept of pointers and file system for handling data storage.(K2)

Program Name: B.Tech **Faculty Name:** Anand Thota

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE – A & B	I-I	**COMPUTER PROGRAMMING LAB**	R161119	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
42 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO2: Problem analysis:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

PO3: Design/development of solutions:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO4: Conduct Investigations of Complex problems:

Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1 Practices of mathematical ideas: By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.

PSO2 Practices of Computing: The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.

PSO3 Practices of Software Development: By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Objectives:

Student able to

1. Understand the basic concept of C Programming, and its different modules that includes conditional and looping expressions, Arrays, Strings, Functions, Pointers, Structures and File programming.
2. Acquire knowledge about the basic concept of writing a program.
3. Role of constants, variables, identifiers, operators, type conversion and other building blocks of C Language.
4. Use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.
5. Role of Functions involving the idea of modularity.

Course Outcomes:

Student able to:

CO7: Apply and practice logical ability to solve the problems and Analyzing the complexity of problems, Modularize the problems into small modules and then convert them into programs (K3)

Program Name: B.TECH **Faculty Name: A. BINDU MADHAVI**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	I-I	APPLIED PHYSICS LAB	R161115	2016

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory	Practical 6	3	Internal 25	External 50	3

Outcome: *Physics lab curriculum gives fundamental understanding of design of an instrument with targeted accuracy for physical measurements.*

Programme Outcomes:

1. **Engineering knowledge:**
   a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:**
   a. Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:**
   a. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:**
   a. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:**
   a. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:**

a. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	Produce graduates who will demonstrate skills required to communicate, collaborate and continue to learn effectively as ethically and socially responsible computer science and engineering professionals.
selected as the course does not address any aspects.	
PSO2	Produce graduates who will be employed as Computer Science & Engineering professionals who serve beyond entry level positions in industrial/R&D organizations and/or be making satisfactory progress in higher degree programs in national/international repute institutes
selected as the course does not address any aspects.	
PSO 3	Predict the changing direction of information technology and evaluate and communicate the likely utility of new technologies to computer science and engineering professionals.
Not selected as the course does not address any aspects.	

SYLLABUS

LIST OF EXPERIMENTS:

1. ***Determination of wavelength of a source-Diffraction Grating-Normal incidence.***
2. ***Newton's rings – Radius of Curvature of Plano - Convex Lens.***
3. ***Determination of thickness of a spacer using wedge film and parallel interference fringes.***
4. ***Determination of wavelength of laser source using diffraction grating.***

5. Determination of Planck's constant using photocell.
6. Determination of Young's modulus by method of single cantilever oscillations.
7. Determination of Rigidity modulus of a material- Torsional Pendulum
8. Determination of lattice constant – lattice dimensions kit.
9. Determination of velocity of sound – Volume Resonator.
10. Melde's experiment – Transverse and Longitudinal modes.
11. Determination of surface tension of liquid by capillary rise method.
12. ***Determination of Acceleration due to Gravity and Radius of Gyration- Compound Pendulum***.
13. L- C- R Series Resonance Circuit.
14. Study of I/V Characteristics of Semiconductor diode.
15. I/V characteristics of Zener diode.
16. Energy Band gap of a Semiconductor p - n junction.
17. Time constant of CR circuit
18. Verification of laws of vibrations in stretched strings – Sonometer.

20. Hall Effect in semiconductors.
21. Magnetic field along the axis of a current carrying coil – Stewart and Gee's apparatus.

	Course Outcome	POs/ PSOs	CL (Cognitive level)	Class Sessions
CO1	Determination of the physical values with targeted accuracy by explaining the principle involved in design of instruments.	PO1,PO2,PO4,PO6 ,PO7,PO8,PO9,PO10 PO11,PO12,PSO1	**Evaluation**	6

CO	**POs**												**PSOs**		
	PO1 (K3)	**PO2 (K4)**	**PO3 (K6)**	**PO4 (K6)**	**PO5 (K6)**	**PO6 (K6)**	**PO7 (K1)**	**PO8 (K3)**	**PO9 (K3)**	**PO10 (K2)**	**PO11 (K5)**	**PO12 (K2)**	**PSO1 (K5)**	**PSO2 (K5)**	**PSO3 (K5)**
CO 1 (K5)	**3**	**3**		**1**		**1**	**3**	**3**	**3**	**3**	**2**	**3**	**1**		

Program Name: CSE-A&B **Faculty Name: Dr.P.S. SRINIVAS**

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	II	Engineering Drawing	R161106	11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
80 Hours	Theory 4	Practical	3	Internal 30	External 70	3

OBJECTIVES: Engineering drawing being the principle method of communication for engineers, the objective to introduce the students, the techniques of constructing the various types of polygons, curves and scales. The objective is also to visualize and represent the 3D objects in 2D planes with proper dimensioning, scaling etc.

The courses are designed to:

• To introduce the use and the application of drawing instruments and to make the students construct the polygons, curves and various types of scales. The student will be able to understand the need to enlarge or reduce the size of objects in representing them.

• To introduce orthographic projections and to project the points and lines parallel to one plane and inclined to other.

• To make the students draw the projections of the lines inclined to both the planes.

• To make the students draw the projections of the plane inclined to both the planes.

• To make the students draw the projections of the various types of solids in different positions inclined to one of the planes.

• To represent the object in 3D view through isometric views. The student will be able to represent and convert the isometric view to orthographic view and vice versa.

COUIRSE OUTCOME:

1. Understand the importance of BIS and ISO Standards in Engineering Drafting 2. Graphically construct and understand the importance of mathematical curves in Engineering applications 3. Visualize geometrical lines in 3D space through exercises in Orthographic Projections 4. Visualize geometrical Planes in 3D space through exercises in Orthographic Projections 5. Visualize geometrical Solids in 3D space through exercises in Orthographic Projections 6. Interpret Orthographic, Isometric and Perspective views of objects

Programme Outcomes:

1. Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage:

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PS01

Produce graduates who will demonstrate skills required to communicate, collaborate and continue to learn effectively as ethically and socially responsible computer science and engineering professionals.

PS02

Produce graduates who will be employed as Computer Science & Engineering professionals who serve beyond entry level positions in industrial/R&D organizations and/or be making satisfactory progress in higher degree programs in national/international repute institutes.

PS03

Predict the changing direction of information technology and evaluate and communicate the likely utility of new technologies to computer science and engineering professionals

SYLLABUS

UNIT I Polygons, Construction of regular polygons using given length of a side; Ellipse, arcs of circles and Oblong methods; Scales – Vernier and Diagonal scales.

UNIT II Introduction to orthographic projections; projections of points; projections of straight lines parallel to both the planes; projections of straight lines – parallel to one plane and inclined to the other plane.

UNIT III Projections of straight lines inclined to both the planes, determination of true lengths, angle of inclinations and traces.

UNIT IV Projections of planes: regular planes perpendicular/parallel to one plane and inclined to the other reference plane; inclined to both the reference planes.

UNIT V Projections of Solids – Prisms, Pyramids, Cones and Cylinders with the axis inclined to one of the

planes.

UNIT VI Conversion of isometric views to orthographic views; Conversion of orthographic views to isometric views.

Text Books:

1. Engineering Drawing, N. D. Butt, Chariot Publicatio

Program Name: B.Tech **Faculty Name: Dr. A.Rama Devi**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	I-II	ECS-II	R161221	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
33 Hours	Theory 4	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

	Program Outcome
PO1.	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
Not-selected as the course does not address any of these aspects.	
PO2.	**Problem analysis**: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Not-selected as the course does not address any of these aspects.	
PO3.	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
Not-selected as the course does not address any of these aspects.	
PO4.	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Not-selected as the course does not address any of these aspects.	
PO5.	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
Not-selected as the course does not address any of these aspects.	
PO6.	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
Not-selected as the course does not address any of these aspects.	
PO7.	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
Selected as the course addresses knowledge domain for sustainable development	
PO8.	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
Not-selected as the course does not address ethical issues .	
PO9.	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
Selected as the course addresses the importance of teamwork and leadership qualities.	
PO10.	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
Selected as the course addresses the importance of communication skills and effective presentation.	
PO11.	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
Selected as students can understand how to manage projects in multidisciplinary environment	
PO12.	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
Selected as student can recognize the need for life-long learning.	

Programme Specific Outcomes:

PSO1	Practices of mathematical ideas: By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
Not-selected as the course does not address any of these aspects.	
PSO2	Practices Of Computing: The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
Not-selected as the course does not address any of these aspects.	
PSO3	Practices of Software Development: By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and plat form independent skills
Not selected as the course does not address any aspects.	

Course Objective:

To communicate in English very clearly and effectively

Course Outcomes:

CO1: Develop LSRW Skills to communicate effectively.

SYLLABUS: ENGLISH COMMUNICATION SKILLS LAB – II

UNIT 1
Debating
Practice Work
UNIT 2:
Group Discussions
Practice Work
UNIT 3:
Presentation Skills
Practice Work
UNIT 4:
Interview Skills
Practice Work
UNIT 5:
3. Mail
Curriculum
Vitae Practice
Work UNIT 6:
Idiomatic Expressions
Common Errors in English
Practice Work

Program Name: I BTECH **Faculty Name: S.SRAVYA**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	I-II	APPLIED CHEMISTRY	**R161227**	5/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
39Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

Program Outcome	
PO1.	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
Selected as application of knowledge of mathematics and science is involved in calculating troubles by chemical methods and instrumental methods of analysis.	
PO2.	Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Selected as students can identify and analyze complex engineering problems and can adopt new methods .	
PO3.	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
Selected as the student can developchemicaland instrumental methods for the public health and safety, and the cultural, societal, and environmental considerations.	

PO4.	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Selected as students are required to do experiments using electronic devices like conductometers, potentiometers.

PO5.	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

selected as the course apply appropriate techniques and modern engineering tools

PO6.	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

selected as the contextual knowledge of conductance, potential of materials helps to assess societal, health and safety issues

PO7.	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Selected as the course address issues related to environment and sustainability.

PO8.	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Selected as the courseapply ethical principles and responsibilities and norms of the engineering practice.

PO9.	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Not selected as the course does not related.

PO10.	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Not Selected as the course does not address complex engineering activities with the engineering community.

PO11.	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Not Selected as course doesnot relate to this.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Selected as student can recognize the need for life-long learning in the context of technological change.

Programme Specific Outcomes:

PSO1	Practices of mathematical ideas: By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms
Not selected as the course does not address any aspects.	
PSO2	Practices Of Computing: The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
Not selected as the course does not address any aspects.	
	PSO3 Practices of Software Development: By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and plat form independent skills

Not selected as the course does not address any aspects.

Course Objectives:

3. The students entering into the professional course have practically very little exposure to lab classes.
4. The experiments introduce volumetric analysis; redox titrations with different indicators; EDTA titrations; then they are exposed to a few instrumental methods of chemical analysis.

Course Outcomes:

	Course Outcome	POs/ PSOs	CL (Cognitive level)	Class Sessions Taken
CO - 1	Develop the knowledge of volumetric and instrumental methods of analysis in determining the quality of unknown products.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO12.	EV	14

List of Experiments

3. Introduction to chemistry laboratory – Molarity, Normality, Primary, Secondary standard solutions, Volumetric titrations, Quantitative analysis, Quantitative analysis etc.,
4. Trial experiment – Estimation of HCI using standard Na_2CO_3 solutions
5. Determination of alkalinity of a sample containing Na_2CO_3 and NaOH.
6. Determination of $KMnO_4$ using standard Oxalic acid solution.
7. Determination of Ferrous iron using standard $K_2Cr_2O_7$ solution.
8. Determination of Copper using standard $K_2Cr_2O_7$ solution.
9. Determination of temporary and permanent hardness of water using standard EDTAsolution.
10. Determination of Copper using standard EDTA solution.
11. Determination of Iron by a Colorimetric method using thiocyanate as reagent.
12. Determination of pH of the given sample solution using pH meter.
13. Conductometric titration between strong acid and strong base.
14. Conductometric titration between strong acid and weak base.

3. Potentiometric titration between strong acid and strong base.
4. Potentiometric titration between strong acid and weak base.
5. Determination of Zinc using standard EDTA solution.
6. Determination of Vitamin – C.

Program Name: I BTECH **Faculty Name: S.SRAVYA**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	I-II	ENVIRONMENTAL STUDIES	R161212	5/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
42 Hours	Theory 3	Practical	3	Internal 30	External 70	3

Programme Outcomes:

	Program Outcome
PO1.	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
Selected as application knowledge of topography for calculating challenges of environment.	
PO2.	**Problem analysis**: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Selected as students can identify and analyze the problems of natural recourses and can adopt new methods to over-exploitation.	
PO3.	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
Selected as the student can nature and conserve species richness	
PO4.	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to

	provide valid conclusions.
Selected as students are required to overcome pollution using plants as devices like green campus and green belt.	
PO5.	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
selected as students learn the usage of environmental laws as tools to protect the environment..	
PO6.	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
selected as ,by the contextual knowledge of green business ,green politics can asses societal, health and safely.	
PO7.	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
Selected as the course address issues related to environment and sustainabilit.	
PO8.	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
selected as the course needs ethical values.	
PO9.	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
selected as the course needs awareness about waste management and pollution control.	
PO10.	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
Selected as the course needs effective communication for sustainability.	
PO11.	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
Selected as students can understand how to manage projects in multidisciplinary environment	
PO12.	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

selected as student can recognize the need for life-long learning in the context of technological change

Programme Specific Outcomes:

PSO1 Practices of mathematical ideas: By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms

Not selected as the course does not address any aspects.

PSO2 Practices Of Computing: The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.

Not selected as the course does not address any aspects.

PSO3 Practices of Software Development: By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and plat form independent skills

Not selected as the course does not address any aspects.

Course Objectives:

•Overall understanding of the natural resources.
• Basic understanding of the ecosystem and its diversity.
3. Acquaintance on various environmental challenges induced due to unplanned anthropogenic activities.
• An understanding of the environmental impact of developmental activities.
• Awareness on the social issues, environmental legislation and global treaties

Course Outcomes:

	Course Outcome	POs/ PSOs	CL (Cognitive level)	Class Sessions taken
CO1 K2	Illustrate various environmental challenges due to anthropogenic activities &awareness on social issues	P01, P02, P03, P04, P05, P06, P07, P08, P09	UN	14
CO2K2	*To make students understand the importance of natural resources and their conservation.*	P01, P02, P03, P05, P06, P07, P08, P09, P010, P012	UN	11
C03 K3	*Solve the threats of bio-diversity*	P01, P02, P03, P04, P05, P06, P07, P08, P09, P010,	SOLVE	8

		PO11, PO12		
CO4 K2	Minimize the pollution by creating awareness in people	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11,PO12	UN	9
CO5 K3	Minimize environmental laws to combat the challenges	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO10	SOLVE	9
CO6 K2	*Create awareness on green concepts.*	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12.	UN	10
Total Hours of instruction				42

UNIT – I Multidisciplinary nature of Environmental Studies: Definition, Scope and Importance – Sustainability: Stockholm and Rio Summit–Global Environmental Challenges: Global warming and climate change, Carbon Credits, acid rains, ozone layer depletion, population growth and explosion, effects. Role of information Technology in Environment and human health

Ecosystems: Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems.

UNIT – II Natural Resources: Natural resources and associated problems Forest resources – Use and over – exploitation, deforestation – Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, Sustainable mining of Granite, Literate, Coal, Sea and River sands. Food resources: World food problems, changes caused by non-agriculture activities-effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources Vs Oil and Natural Gas Extraction. Land resources: Land as a resource, land degradation, Wasteland reclamation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

UNIT – III Biodiversity and its conservation: Definition: genetic, species and ecosystem diversityclassification - Value of biodiversity: consumptive use, productive use, social-Biodiversity at national and local levels. India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, man-wildlife conflicts - Endangered and endemic species of India – Conservation of biodiversity: conservation of biodiversity.

UNIT – IV Environmental Pollution: Definition, Cause, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution, Nuclear hazards. Role of an individual in prevention of pollution. - Pollution case studies, Sustainable Life Studies. Solid Waste Management: Sources, Classification, effects and control measures of urban and industrial solid wastes. Consumerism and waste products, Biomedical, Hazardous and e – waste management.

UNIT – V Social Issues and the Environment: Urban problems related to energy -Water conservation, rain water harvesting-Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issues and possible solutions. Environmental Protection Act -Air (Prevention and Control of Pollution) Act. –Water (Prevention and control of Pollution) Act -Wildlife Protection Act - Forest Conservation Act-Issues involved in enforcement of environmental legislation. -Public awareness. UNIT – VI Environmental Management: Impact Assessment and its significance various stages of EIA, preparation of EMP and EIS, Environmental audit. Ecotourism, Green Campus – Green business and Green politics. The student should Visit an Industry/Ecosystem and submit a report individually on any issues related to Environmental Studies course and make a power point presentation.

Text Books: 1. Environmental Studies, K.V. S. G. Murali Krishna, VGS Publishers, Vijayawada 2. Environmental Studies , R. Rajagopalan, 2nd Edition, 2011, Oxford University Press. 3. Environmental Studies, P.N. Palanisamy, P. Manikandan, A. Geetha, and K. Manjula Rani; Pearson Education, Chennai Reference: 1. Text Book of Environmental Studies, Deeshita Dave & P. UdayaBhaskar, Cengage Learning. 2. A Textbook of Environmental Studies, Shaashi Chawla, TMH, New Delhi 3. Environmental Studies, Benny Joseph, Tata McGraw Hill Co, New Delhi 4. “Perspectives in Environment Studies” Anubha Kaushik, C P Kaushik, New Age International

Program Name: B.Tech **Faculty Name: Dr. A.Rama Devi**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	I-II	ENGLISH-II	R161201	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
56 Hours	Theory 4	Practical 3	3	Internal 30	External 70	3

Programme Outcomes:

	Program Outcome
PO1.	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
Not-selected as the course does not address any of these aspects.	
PO2.	**Problem analysis**: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Not-selected as the course does not address any of these aspects.	
PO3.	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
Not-selected as the course does not address any of these aspects.	
PO4.	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
Not-selected as the course does not address any of these aspects.	
PO5.	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
Not-selected as the course does not address any of these aspects.	
PO6.	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
Not-selected as the course does not address any of these aspects.	
PO7.	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need

	for sustainable development.
Selected as the course addresses knowledge domain for sustainable development	
PO8.	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
Not-selected as the course does not address ethical issues .	
PO9.	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
Selected as the course addresses the importance of teamwork and leadership qualities.	
PO10.	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
Selected as the course addresses the importance of communication skills and effective presentation.	
PO11.	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
Selected as students can understand how to manage projects in multidisciplinary environment	
PO12.	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
Selected as student can recognize the need for life-long learning.	

Programme Specific Outcomes:

PSO1	Practices of mathematical ideas: By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
Not-selected as the course does not address any of these aspects.	
PSO2	Practices Of Computing: The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
Not-selected as the course does not address any of these aspects.	
PSO3	Practices of Software Development: By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and plat form independent skills
Not selected as the course does not address any aspects.	

Course Objectives:

1.To learn the skills of grammar
2.To communicate in English very clearly and effectively
Course Outcomes:
CO1: Develop English language skills in letter writing.
CO2: Improve technical writing skills
CO3:Interpret differentculturalshocksduetoglobalization
CO4: Improve assertive skills
CO5: Develop vocabulary skills in English language.
CO6: Apply various skills of grammar to speak and write flawless language

SYLLABUS:

DETAILEDTEXTBOOK:ENGLISH ENCOUNTERS Published by MaruthiPublishers.
NON-DETAIL: THE GREAT INDIAN SCIENTISTS Published by**Cengage learning**

UNIT 1:
'TheGreatestResource-Education'fromEnglishEncounters'APJAbdulKalam'fromTheGreatIndianScientists.

UNIT 2:
'ADilemma'fromEnglishEncounters'CVRaman'fromTheGreatIndianScientists.

UNIT 3:
'CulturalShock':AdjustmentstonewCulturalEnvironmentsfromEnglishEncounters.'HomiJehangirBhabha'fromTheGreatIndianScientists.

UNIT 4:
'TheLottery'fromEnglishEncounters.'JagadishChandraBose'fromTheGreatIndianScientists.

UNIT 5:

'TheHealthThreatsofClimateChange'fromEnglishEncounters.PrafullaChandraRay'fromTheGreatIndianScientists.

UNIT 6:

'TheChiefSoftwareArchitect'fromEnglishEncounters'SrinivasaRamanujan'fromTheGreatIndianScientists.

Program Name: B.Tech **Faculty Name: Anand Thota**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE – A & B	I-II	OBJECT ORIENTED PROGRAMMING THROUGH C++	R161215	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
72 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO2: Problem analysis:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

PO3: Design/development of solutions:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO4: Conduct Investigations of Complex problems:

Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1 Practices of mathematical ideas: By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.

PSO2 Practices of Computing: The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.

PSO3 Practices of Software Development: By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Objectives:

Student able to

3. **Understand** the basic object oriented programming concepts and apply them in problem solving.
4. **Demonstrate** inheritance concepts for reusing the program
5. **Illustrate** on the member function overloading using polymorphism
6. **Develop** real world programs using generic programming.
7. **Understand** STL programming.

Course Outcomes:

Student able to:

CO1: **Understand** object oriented programming concepts to solve real world problems.(K2)

CO2: **Illustrate** the behavior of programs involving the basic programming constructs like control structures, Constructors and Destructors.(K2)

CO3: **Illustrate** the concept of abstract classes and inheritance to define generic classes.(K2)

CO4: **Apply** dynamic and static polymorphism to process objects depending on their class. (K3)

CO5: **Understand** the impact of exception handling to avoid abnormal termination of program and standard template programming. (K2)

CO6: **Understand the** concept of Standard Template Library(K2

Program Name: B.Tech **Faculty Name: Anand Thota**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE – A & B	I-II	OBJECT ORIENTED PROGRAMMING LAB	R161229	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
42 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO2: Problem analysis:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

PO3: Design/development of solutions:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO4: Conduct Investigations of Complex problems:

Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1 Practices of mathematical ideas: By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.

PSO2 Practices of Computing: The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.

PSO3 Practices of Software Development: By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Objectives:

Student able to

- **Learn** adequate knowledge by problem solving techniques. Acquire knowledge about the basic concept of writing a program.
- **Understand** programming skills using the fundamentals and basics of object oriented Language.
- **Demonstrate** the differences between traditional imperative design and object-oriented design.
- **Improve** problem solving skills using inheritance, polymorphism, dynamic binding and generic structures in building reusable code.
- **Illustrate** standard temporary library.

Course Outcomes:

CO7: **Apply** object-oriented concepts to develop real world applications. (K3)

2. ns

3. Engineering Drawing, K. L. Narayana & P. Kannaiah, Scitech Publishers.

4. Engineering Graphics, P.I. Varghese, McGraw Hill Publishers

Reference Books:

1. Engineering Graphics for Degree, K. C. John, PHI Publishers

2. Engineering Drawing, Agarwal & Agarwal, Tata McGraw Hill Publishers

3. Engineering Drawing + AutoCad – K Venugopal, V. Prabhu Raja, New Age.

CSE-HOD

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY

VIJAYAWADA - 520 001.

Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: B.Tech Faculty Name: **G. Padmaja**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	II-I	Statistics With R programming	R1621051	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4+1	Practical	3	Internal 30	External 70	3

Programme Outcomes:

4. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

5. Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

6. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

7. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

8. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

9. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

10. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and norms of the engineering practice.

5. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

6. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

7. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Objectives:

15. Use R for statistical programming, computation, graphics, and modeling,

16. Write functions and use R in an efficient way,

17. Fit some basic types of statistical models.

18. Use R in their own research,

19. Be able to expand their knowledge of R on their own.

Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Create Various Advanced Data structures through R	Create
CO2	Develop R programs using control structures	Create
CO3	Apply Math and Simulation functions on various Problems like Vector cross product, Finding Stationary Distribution of Markov Chains and Vector cross product	Apply
CO4	Develop Graphs using different R graphical functions.	Create
CO5	Test the hypothesis using various probability distributions.	Evaluate
CO6	Illustrate the linear and non linear regression models Understand	Understand

UNIT-I:

Introduction, How to run R, R Sessions and Functions, Basic Math, Variables, Data Types, Vectors, Conclusion, Advanced Data Structures, Data Frames, Lists, Matrices, Arrays, Classes.

UNIT-II:

R Programming Structures, Control Statements, Loops, - Looping Over Non vector Sets,- If-Else, Arithmetic and Boolean Operators and values, Default Values for Argument, Return Values, Deciding Whether to explicitly call return- Returning Complex Objects, Functions are Objective, No Pointers in R, Recursion, A Quicksort Implementation-Extended Extended Example: A Binary Search Tree.

UNIT-III:

Doing Math and Simulation in R, Math Function, Extended Example Calculating Probability Cumulative Sums and Products-Minima and Maxima- Calculus, Functions Fir Statistical Distribution, Sorting, Linear Algebra Operation on Vectors and Matrices, Extended Example: Vector cross Product- Extended Example: Finding Stationary Distribution of Markov Chains, Set Operation, Input /out put, Accessing the Keyboard and Monitor, Reading and writer Files,

UNIT-IV:

Graphics, Creating Graphs, The Workhorse of R Base Graphics, the plot() Function – Customizing Graphs, Saving Graphs to Files.

UNIT-V:

Probability Distributions, Normal Distribution- Binomial Distribution- Poisson Distributions Other Distribution, Basic Statistics, Correlation and Covariance, T-Tests,-ANOVA.

UNIT-VI:

Linear Models, Simple Linear Regression, -Multiple Regression Generalized Linear Models, Logistic Regression, - Poisson Regression- other Generalized Linear Models-Survival Analysis, Nonlinear Models, Splines- Decision- Random Forests, Program Name B.Tech Faculty Name: **Mr. Bhanu Chandra**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	II-I	Mathematical Foundations of Computer Science	R1621052	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4+1	Practical	3	Internal 30	External 70	3

Programme Outcomes:

7. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

8. Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

9. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

10. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

11. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

12. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

4. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

9. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

10. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Objectives:

- To introduce the students to the topics and techniques of discrete methods and combinatorial reasoning.
- To introduce a wide variety of applications. The algorithmic approach to the solution of problems is fundamental in discrete mathematics, and this approach reinforces the close ties between this discipline and the area of computer science.

Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Create Various Advanced Data structures through R	Create
CO2	Develop R programs using control structures	Create
CO3	Apply Math and Simulation functions on various Problems like Vector cross product, Finding Stationary Distribution of Markov Chains and Vector cross product	Apply
CO4	Develop Graphs using different R graphical functions.	Create

CO5	Test the hypothesis using various probability distributions.	Evaluate
CO6	Illustrate the linear and non linear regression models Understand	Understand

UNIT –I Mathematical Logic:

Propositional Calculus: Statements and Notations, Connectives, Well Formed Formulas, Truth Tables, Tautologies, Equivalence of Formulas, Duality Law, Tautological Implications, Normal Forms, Theory of Inference for Statement Calculus, Consistency of Premises, Indirect Method of Proof. Predicate Calculus: Predicative Logic, Statement Functions, Variables and Quantifiers, Free and Bound Variables, Inference Theory for Predicate Calculus.

UNIT –II Set Theory:

Introduction, Operations on Binary Sets, Principle of Inclusion and Exclusion, Relations: Properties of Binary Relations, Relation Matrix and Digraph, Operations on Relations, Partition and Covering, Transitive Closure, Equivalence, Compatibility and Partial Ordering Relations, Hasse Diagrams, Functions: Bijective Functions, Composition of Functions, Inverse Functions, Permutation Functions, Recursive Functions, Lattice and its Properties.

UNIT- III Algebraic Structures and Number Theory:

Algebraic Structures:Algebraic Systems, Examples, General Properties, Semi Groups and Monoids, Homomorphism of Semi Groups and Monoids, Group, Subgroup, Abelian Group, Homomorphism, Isomorphism

Number Theory: Properties of Integers, Division Theorem, The Greatest Common Divisor, Euclidean Algorithm, Least Common Multiple, Testing for Prime Numbers, The Fundamental Theorem of Arithmetic, Modular Arithmetic (Fermat’s Theorem and Euler’s Theorem)

UNIT –IV Combinatorics:

Basic of Counting, Permutations, Permutations with Repetitions, Circular Permutations, Restricted Permutations, Combinations, Restricted Combinations, Generating Functions of Permutations and Combinations, Binomial and Multinomial Coefficients, Binomial and Multinomial Theorems, The Principles of Inclusion–Exclusion, Pigeonhole Principle and its Application.

UNIT –V Recurrence Relations:

Generating Functions, Function of Sequences, Partial Fractions, Calculating Coefficient of Generating Functions, Recurrence Relations, Formulation as Recurrence Relations, Solving Recurrence Relations by Substitution and Generating Functions, Method of Characteristic Roots, Solving Inhomogeneous Recurrence Relations

UNIT –VI Graph Theory: Basic Concepts of Graphs, Sub graphs, Matrix Representation of Graphs: Adjacency Matrices, Incidence Matrices, Isomorphic Graphs, Paths and Circuits, Eulerian and Hamiltonian Graphs, Multigraphs, Planar Graphs, Euler’s Formula, Graph Colouring and Covering, Chromatic Number, Spanning Trees, Algorithms for Spanning Trees (Problems Only and Theorems without Proofs).

Program Name: B.Tech **Faculty Name: P.Sri Silpa**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE -A	II-I	Digital Logic Design	R1621053	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4+1	Practical	3	Internal 30	External 70	3

Programme Outcomes:

2. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
3. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
4. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
5. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
6. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
7. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
8. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
9. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
10. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
11. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

8. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
9. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Objectives:

13. To introduce the basic tools for design with combinational and sequential digital logic and state machines.

14. To learn simple digital circuits in preparation for computer engineering.

Course Outcomes:

	Course Outcomes	Cognitive Levels
CO1	Apply the principles of number system, binary codes for addition and subtraction of signed and unsigned numbers	Apply
CO2	Solve Boolean algebra expressions with min or max terms	Apply
CO3	Design K-maps to minimize logical functions	Create
CO4	Develop HDL Model and combinational logic circuits composed of encoders, decoders, multiplexers and demultiplexer	Create
CO5	Design Moore and Mealy Models of Finite state machines with storage elements	Create
CO6	Illustrate various Registers and Counters	Understand

UNIT- I: Digital Systems and Binary Numbers

Digital Systems, Binary Numbers, Binary Numbers, Octal and Hexadecimal Numbers, Complements of Numbers, Complements of Numbers, Signed Binary Numbers, Arithmetic addition and subtraction

UNIT -II: Concept of Boolean algebra

Basic Theorems and Properties of Boolean algebra, Boolean Functions, Canonical and Standard Forms, Min terms and Max terms,

UNIT- III: Gate level Minimization

Map Method, Two-Variable K-Map, Three-Variable K-Map, Four Variable K-Maps. Products of Sum Simplification, Sum of Products Simplification, Don't – Care Conditions, NAND and NOR Implementation, Exclusive-OR Function

UNIT- IV: Combinational Logic

Introduction, Analysis Procedure, Design Procedure, Binary Adder−Sub tractor, Decimal Adder, Binary Multiplier, Decoders, Encoders, Multiplexers, HDL Models of Combinational Circuits

UNIT- V: Synchronous Sequential Logic

Introduction to Sequential Circuits, Storage Elements: Latches, Storage Elements: Flip-Flops, Analysis of Clocked Sequential Circuits, Mealy and Moore Models of Finite State Machines

UNIT -VI: Registers and Counters

Registers, Shift Registers, Ripple Counters, Synchronous Counters, Ring Counter, Johnson Counter, Ripple Counter

Program Name: B.Tech **Faculty Name: VSRK Prasad G**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE -A	II-I	Python Programming	R1621054	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4+1	Practical	3	Internal 30	External 70	3

Programme Outcomes:

\endash **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

\endash **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

\endash **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

\endash **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

\endash **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

\endash **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

\endash **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

\endash **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

\endash **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

3. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

4. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
5. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Objectives:

* Introduction to Scripting Language
* Exposure to various problems solving approaches of computer science

Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Create Various Advanced Data structures through R	Create
CO2	Develop R programs using control structures	Create
CO3	Apply Math and Simulation functions on various Problems like Vector cross product, Finding Stationary Distribution of Markov Chains and Vector cross product	Apply
CO4	Develop Graphs using different R graphical functions.	Create
CO5	Test the hypothesis using various probability distributions.	Evaluate
CO6	Illustrate the linear and non linear regression models Understand	Understand

UNIT – I:

Introduction: History of Python, Need of Python Programming, Applications Basics of Python Programming Using the REPL(Shell), Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation.

UNIT – II:

Types, Operators and Expressions: Types - Integers, Strings, Booleans; Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Expressions and order of evaluations Control Flow- if, if-elif-else, for, while, break, continue, pass

UNIT – III:

Data Structures Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences. Comprehensions.

UNIT – IV:

Functions - Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful Functions(Function Returning Values), Scope of the Variables in a Function - Global and Local Variables. Modules: Creating modules, import statement, from. Import statement, name spacing, Python packages, Introduction to PIP, Installing Packages via PIP, Using Python Packages

UNIT – V:

Object Oriented Programming OOP in Python: Classes, 'self variable', Methods, Constructor Method, Inheritance, Overriding Methods, Data hiding, Error and Exceptions: Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User Defined Exceptions

UNIT – VI:

Brief Tour of the Standard Library - Operating System Interface - String Pattern Matching, Mathematics, Internet Access, Dates and Times, Data Compression, Multithreading, GUI Programming, Turtle Graphics Testing: Why testing is required ?, Basic concepts of testing, Unit testing in Python, Writing Test cases, Running Tests.

Program Name: **B.Tech** Faculty Name: **B.HANUMANTHA RAO**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE -A	II-I	Computer Graphics	R1621056	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4+1	Practical	3	Internal 30	External 70	3

Programme Outcomes:

4. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
5. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
6. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
7. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
8. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
9. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
10. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
11. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
12. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

6. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

7. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
8. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Objectives:

6. To develop, design and implement two and three dimensional graphical structures

7. To enable students to acquire knowledge Multimedia compression and animations

8. To learn Creation, Management and Transmission of Multimedia objects.

Course Outcomes:

CO 's	**Course outcome**	**Cognitive level**
CO1	**Describe** the basic output primitive drawing algorithms along with 2D transformation ,viewing &clipping concepts to display the objects	Understand
CO2	**Describe** the theory of 3d transformations, projection ,viewing and visible detection methods	Understand
CO3	**Create** computer graphics programs using opengl,	Apply
CO4	**Create** rendering, shading and animation using opengl.	Apply
CO5	**Create** fractals , Peano curves using iterated and random	Apply
CO6	**Explain** ray tracing intersecting rays with other primitives Adding Surface texture Reflections and Transparency	Understand

UNIT-I:

2D Primitives
Output primitives – Line, Circle and Ellipse drawing algorithms - Attributes of output primitives – Two dimensional Geometric transformations - Two dimensional viewing –Line, Polygon, Curve and Text clipping algorithms.

UNIT-II:

3D Concepts

Parallel and Perspective projections - Three dimensional object representation –Polygons, Curved lines, Splines, Quadric Surfaces, - Visualization of data sets 3Dtransformations – Viewing -Visible surface identification.

UNIT-III:

Graphics Programming Color Models – RGB, YIQ, CMY, HSV – Animations – General Computer Animation, Raster, Keyframe - Graphics programming using OPENGL Basic graphics primitives –Drawing three dimensional objects - Drawing three dimensional scenes

UNIT- IV:

Rendering Introduction to Shading models – Flat and Smooth shading – Adding texture to faces–Adding shadows of objects – Building a camera in a program – Creating shaded objects–Rendering texture – Drawing Shadows.

UNIT- V:

FractalsFractals and Self similarity , Peano curves – Creating image by iterated functions, Mandelbrot sets – Julia Sets – Random Fractals

UNIT- VI:

Overview of Ray Tracing Intersecting rays with other primitives Adding Surface texture Reflections andTransparency – Boolean operations on Objects

Program Name: B.Tech Faculty Name: **Ch.B.V.Durga.**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE -A	II-I	Data Structures through C++	R1621055	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4+1	Practical	3	Internal 30	External 70	3

Programme Outcomes:

2 **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

3 **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

4 **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

5 **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

6 **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

7 **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

8 **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

9 **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

10 **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

11 **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

8. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
9. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Objectives:

13. To be familiar with basic techniques of object oriented principles and exception handling using C++
14. To be familiar with the concepts like Inheritance, Polymorphism
15. Solve problems using data structures such as linear lists, stacks, queues, hash tables
16. Be familiar with advanced data structures such as balanced search trees, AVL Trees, and B Trees.

Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Design various ADT's like Polynomial ADT, Sparse Matrix ADT using Arrays	Create
CO2	Design Stack & Queue ADT's with Templates and Arrays	Create
CO3	Design various linked list ADT's and polynomial operations with Templates and Linked Lists	Create
CO4	Design various operations on Binary Trees, Threaded Binary Trees, Heap Trees and Binary Search Trees.	Create
CO5	Construct Minimum cost spanning trees, Shortest path, and transitive closure with Graph ADT's.	Create
CO6	Analyze Insertion, merge, quick and heap Sorting Techniques.	Analyze

UNIT-I: ARRAYS

Abstract Data Types and the C++ Class, An Introduction to C++ Class- Data Abstraction and Encapsulation in C++- Declaring Class Objects and Invoking Member Functions- Special Class Operations- Miscellaneous

Topics- ADTs and C++Classes, The Array as an Abstract Data Type, The Polynomial Abstract Data type- Polynomial Representation- Polynomial Addition. Spares Matrices, Introduction- Sparse Matrix Representation- Transposing a Matrix- Matrix Multiplication, Representation of Arrays.

UNIT-II: STACKS AND QUEUES

Templates in C++, Template Functions- Using Templates to Represent Container Classes, The Stack Abstract Data Type, The Queue Abstract Data Type, Sub typing and Inheritance in C++, Evaluation of Expressions, Expression- Postfix Notation- Infix to Postfix.

UNIT-III: LINKED LISTS

Single Linked List and Chains, Representing Chains in C++, Defining a Node in C++- Designing a Chain Class in C++- Pointer manipulation in C++- Chain Manipulation Operations, The Template Class Chain, Implementing Chains with Templates- Chain Iterators- Chain Operations- Reusing a Class, Circular Lists, Available Space Lists, Linked Stacks and Queues, Polynomials, Polynomial Representation- Adding Polynomials- Circular List Representation of Polynomials, Equivalence Classes, Sparse Matrices, Sparse Matrix Representation- Sparse Matrix Input- Deleting a Sparse Matrix, Doubly Linked Lists, Generalized Lists, Representation of Generalized Lists- Recursive Algorithms for Lists- Reference Counts, Shared and Recursive Lists

UNIT-IV: TREES

Introduction, Terminology, Representation of Trees, Binary Trees, The Abstract Data Type, Properties of Binary Tress, Binary Tree Representations, Binary Tree Traversal and Tree Iterators, Introduction, In order Traversal Preorder Traversal, Post order Traversal, Thread Binary Trees, Threads, In order Traversal of a Threaded Binary Tree, Inserting a Node into a Threaded Binary Tree, Heaps, Priority Queues, Definition of a Max Heap, Insertion into a Max Heap, Deletion from a Max Heap, Binary Search Trees, Definition, Searching a Binary Search Tree, Insertion into a Binary Search Tree, Deletion from a Binary Search Tree, Height of Binary Search Tree.

UNIT-V: GRAPHS

The Graph Abstract Data Type, Introduction, Definition, Graph Representation, Elementary Graph Operation, Depth First Search, Breadth First Search, Connected Components, Spanning Trees, Bi connected Components, Minimum Cost Spanning Trees, Kruskal S Algorithm, Prim s Algorithm Sollin’ s Algorithm, Shortest Paths and Transitive Closure, Single Source/All Destination: Nonnegative Edge Cost, Single Source/All Destination: General Weights, All-Pairs Shortest Path, Transitive Closure.

UNIT-VI: SORTING

Insertion Sort, Quick Sort, Merge Sort Merging, Iterative Merge Sort, Recursive Merge Sort, Heap Sort.

Program Name:B.Tech Faculty Name: **Ch.B.V.Durga.**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE A&B	II-I	DATASTRUCTURES THROUGH C++ LAB	R1621057	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	**Instructional Hours for Week**		**Duration of semester End Examination in Hours**	**Max Marks**		**Credits**
60 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Objectives:

22. To develop skills to design and analyze simple linear and non linear data structures

23. To Strengthen the ability to identify and apply the suitable data structure for the given real world problem

24. To Gain knowledge in practical applications of data structures

Course Outcomes:

	Course Outcomes	Cognitive Levels
CO1	Develop Linear, Non Linear Data Structures and sorting techniques.	Create

- Implementation of Singly linked list.
- Implementation of Doubly linked list.
- Implementation of Multistack in a Single Array.
- Implementation of Circular Queue
- Implementation of Binary Search trees.
- Implementation of Hash table.
- Implementation of Heaps.
- Implementation of Breadth First Search Techniques.

- Implementation of Depth First Search Techniques.
- Implementation of Prim's Algorithm.
- Implementation of Dijkstra's Algorithm.
- Implementation of Kruskal's Algorithm
- Implementation of Merge Sort
- Implementation of Quick Sort
- Implementation of Data Searching using divide and conquer technique

Program Name:B.Tech Faculty Name: **VSRK Prasad G**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE A&B	II-I	Python Programming Lab	R1621058	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

10. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
11. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO
COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: B.Tech Faculty Name: **D.DURGA PRASAD**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	II-II	Software Engineering	R1622051	19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4+1	Practical	3	Internal 30	External 70	3

Programme Outcomes:

11. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
12. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
13. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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13. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
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COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: B.Tech   Faculty Name: **Mr.I.MURALI KRISHNA**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	II-II	Java Programming	R1622052	19-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
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Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Explain the principles of the Object-Oriented Programming and key features of Java language	**Understand**
CO2	Design Java classes and objects using constructor	**Create**
CO3	Apply various Object -Oriented features like Inheritance, dynamic polymorphism, Packaging and Exception handling on Java classes	**Apply**
CO4	Illustrate the multi-threading and file operations in Java	**Understand**
CO5	Apply Event driven features using Applets	**Apply**
CO6	Design Graphical User Interfaces for applications	**Create**

SYLLABUS

UNIT-I:

Introduction to OOP, procedural programming language and object oriented language, principles of OOP, applications of OOP, history of java, java features, JVM, program structure. Variables, primitive data types, identifiers, literals, operators, expressions, precedence rules and associativity, primitive type conversion and casting, flow of control.

UNIT-II:

Classes and objects, class declaration, creating objects, methods, constructors and constructor overloading, garbage collector, importance of static keyword and examples, this keyword, arrays, command line arguments, nested classes.

UNIT-III:

Inheritance, types of inheritance, super keyword, final keyword, overriding and abstract class. Interfaces, creating the packages, using packages, importance of CLASSPATH and java.lang package. Exception handling, importance of try, catch, throw, throws and finally block, user defined exceptions, Assertions.

UNIT-IV:

Multithreading: introduction, thread life cycle, creation of threads, thread priorities, thread synchronization, communication between threads. Reading data from files and writing data to files, random access file.

UNIT-V:

Applet class, Applet structure, Applet life cycle, sample Applet programs. Event handling: event delegation model, sources of event, Event Listeners, adapter classes, inner classes.

UNIT-VI:

AWT: introduction, components and containers, Button, Label, Checkbox, Radio Buttons, List Boxes, Choice Boxes, Container class, Layouts, Menu and Scrollbar.

Program Name: B.Tech Faculty Name: **CH.B.V.DURGA**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	II-II	Advanced Data Structures	R1622053	19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

5. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
6. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
7. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
8. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
9. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
10. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

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12. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
13. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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15. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
16. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Outcomes:

	Course Outcomes	Cognitive Levels
CO1	Design various optimised external sorting algorithms like K-way Merge sort , Parallelly operative buffer handling.	Create
CO2	Demonstrate varioushashing techniques like static hashing and dynamic hashing using hash tables, directories and continuous address spaces.	Apply
CO3	Demonstrate the operations performed onBinary heaps and Binomial Queues .	Apply
CO4	Design AVL trees, Red-Black trees for efficient insertion and deletion operations.	Create
CO5	Demonstrate search , insertion ad delete operations using M-Way trees, B trees and B+ trees.	Apply
CO6	Demonstrate insert ,delete ,search operations using various digital search structures like binary tries , Patricia tries , multiway tries,	Apply

	compressed tries, Bit tries and fixed bit tries.	

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UNIT-I: SORTING
External Sorting, Introduction, K-way Merging - Buffer Handling for parallel Operation- Run Generation- Optimal Merging of Runs.

UNIT-II: HASHING
Introduction-Static Hashing- Hash Table- Hash Functions- Secure Hash Function- Overflow Handling- Theoretical Evaluation of Overflow Techniques, Dynamic Hashing- Motivation for Dynamic Hashing -Dynamic Hashing Using Directories- Directory less Dynamic Hashing,

UNIT-III: PRIORITY QUEUES (HEAPS)
Model, Simple Implementation, Binary Heap-Structure Property-Heap-Order Property-Basic Heap Operations- Other Heap Operation, Applications of Priority Queues- The Selection Problem Event Simulation Problem, Binomial Queues- Binomial Queue Structure – Binomial Queue Operation- Implementation of Binomial Queues

UNIT-IV: EFFICIENT BINARY SEARCH TREES
Optimal Binary Search Trees, AVL Trees, Red-Black Trees, Definition- Representation of a Red- Black Tree- Searching a Red-Black Tree- Inserting into a Red Black Tree- Deletion from a Red-Black Tree- Joining Red-Black Trees, Splitting a Red-Black tree.

UNIT-V: MULTIWAY SEARCH TREES
M-Way Search Trees, Definition and Properties- Searching an M-Way Search Tree, B-Trees, Definition and Properties- Number of Elements in a B-tree- Insertion into B-Tree- Deletion froma B-Tree- B+-Tree Definition- Searching a B+-Tree- Insertion into B+-tree- Deletion from aB+-Tree.

UNIT-VI: DIGITAL SEARCH STRUCTURES
Digital Search Trees, Definition- Search, Insert and Delete- Binary tries and Patricia, Binary Tries, Compressed Binary Tries- Patricia, Multiway Tries- Definitions- Searching a Trie- Sampling Strategies- Insertion into a Trie- Deletion from a Trie- Keys with Different Length- Height of a Trie- Space Required and Alternative Node Structure- Prefix Search and Applications- Compressed Tries- Compressed Tries With Skip Fields- Compressed Tries With Labeled Edges- Space Required by a Compressed Tries, Tries and Internet Packet Forwarding - IP Routing- 1-Bit Tries- Fixed-Stride Tries-Variable-Stride Tries

Program Name: B.Tech Faculty Name: **G.Padmaja**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	II-II	Computer Organization	R1622054	19-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

- **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

12. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
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Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	ic structure of Computer and its components.	Understand
CO2	Illustrate Register transfer and various internal micro-instructions in digital hard ware.	Understand
CO3	Analyze different types of micro processor instructions.	Analyze
CO4	ccessing mechanisms in input and output organization.	Understand
CO5	Distinguish different kinds of memories in digital computer system	Analyze
CO6	Illustrate basic concepts of hardwired control unit and micro programmed control unit.	Understand

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UNIT -I:

Basic Structure Of Computers: Functional unit, Basic Operational concepts, Bus structures, System Software, Performance, The history of computer development.

UNIT -II:

Machine Instruction and Programs:

Instruction and Instruction Sequencing: Register Transfer Notation, Assembly Language Notation, Basic Instruction Types,

Addressing Modes, Basic Input/output Operations, The role of Stacks and Queues in computer programming equation. Component of Instructions: Logic Instructions, shift and Rotate Instructions

UNIT -III:

Type of Instructions: Arithmetic and Logic Instructions, Branch Instructions, Addressing Modes, Input/output Operations

UNIT -IV:

INPUT/OUTPUT ORGANIZATION: Accessing I/O Devices, Interrupts: Interrupt Hardware, Enabling and Disabling Interrupts, Handling Multiple Devices, Direct Memory Access,

Buses: Synchronous Bus, Asynchronous Bus, Interface Circuits, Standard I/O Interface: Peripheral Component Interconnect (PCI) Bus, Universal Serial Bus (USB)

UNIT -V:

The MEMORY SYSTEMS:

Basic memory circuits, Memory System Consideration, Read- Only Memory: ROM, PROM, EPROM, EEPROM, Flash Memory, Cache Memories: Mapping Functions, interleaving, Secondary Storage: Magnetic Hard Disks, Optical Disks

UNIT -VI:

Processing Unit: Fundamental Concepts: Register Transfers, Performing An Arithmetic Or Logic Operation, Fetching A Word From Memory, Execution of Complete Instruction, Hardwired Control, Micro programmed Control: Microinstructions, Micro program Sequencing, Wide Branch Addressing Microinstructions with next –Address Field

Program Name: B.Tech Faculty Name: **P.SRI SILPA**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	II-II	Formal Languages and Automata Theory	R1622055	19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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Programme Specific Outcomes:

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Course Outcomes:

CO #	Course Outcome	Cognitive level
CO1	Illustrate the concepts of formal languages and automata	Understand
CO2	Translate the regular expressions to Finite Automata and vice versa	Understand
CO3	Illustrate about grammars, classification and simplification of grammars and context free grammars	Understand
CO4	Design various PDA like DPDA and NPDA	Create
CO5	Design TM for various languages	Create
CO6	Differentiate between decidable and undecidable problems	Understand

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UNIT – I: Finite Automata

Why Study Automata Theory? The Central Concepts of Automata Theory, Automation, Finite Automation, Transition Systems, Acceptance of a String by a Finite Automation, DFA, Design of DFAs, NFA, Design of NFA, Equivalence of DFA and NFA, Conversion of NFA into DFA, Finite Automata with E-Transition, Minimization of Finite Automata, Mealy and Moore.

UNIT – II: Regular Expressions

Regular Expressions, Regular Sets, Identity Rules, Equivalence of two Regular Expressions, Manipulations of Regular Expressions, Finite Automata, and Regular Expressions, Inter Conversion, Equivalence between Finite Automata and Regular Expressions, Pumping Lemma, Closers Properties, Applications of Regular Expressions, Finite Automata and Regular Grammars, Regular Expressions and Regular Grammars.

UNIT – III: Context Free Grammars

Formal Languages, Grammars, Classification of Grammars, Chomsky Hierarchy Theorem, Context Free Grammar, Leftmost and Rightmost Derivations, Parse Trees, Ambiguous Grammars, Simplification of Context Free Grammars-Elimination of Useless Symbols, E-Productions and Unit Productions, Normal Forms for Context Free Grammars-Chomsky Normal Form and Greibach Normal Form, Pumping Lemma, Closure Properties, Applications of Context Free Grammars

UNIT – IV: Pushdown Automata

Pushdown Automata, Definition, Model, Graphical Notation, Instantaneous Description Language Acceptance of pushdown Automata, Design of Pushdown Automata, Deterministic and Non – Deterministic Pushdown Automata, Equivalence of Pushdown Automata and Context Free Grammars Conversion, Two Stack Pushdown Automata, Application of Pushdown Automata.

UNIT – V: Turning Machine

Turing Machine, Definition, Model, Representation of Turing Machines-Instantaneous Descriptions, Transition Tables and Transition Diagrams, Language of a Turing Machine, Design of Turing Machines, Techniques for Turing Machine Construction, Types of Turing Machines, Church's Thesis, Universal Turing Machine, Restricted Turing Machine.

UNIT – VI: Computability

Decidable and Un-decidable Problems, Halting Problem of Turing Machines, Post's Correspondence Problem, Modified Post's Correspondence Problem, Classes of P and NP, NP-Hard and NP-Complete Problems.

Program Name: B.Tech Faculty Name: **S.B.R. PRASAD**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	II-II	Principles of Programming Languages	R1622056	19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

\endash **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

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\endash **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

\endash **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

\endash **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

\endash **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

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Programme Specific Outcomes:

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Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Describe syntax and semantics of programming languages.	Understand
CO2	Summarize data, data types, and basic constructs of programming languages.	Understand
CO3	Illustrate the various design issues involved in sub programs and its implementation.	Apply
CO4	Use object-oriented design issues, semaphores, monitors, message passing, exceptions, event handling, and concurrency in various programming languages.	Apply
CO5	Describe the fundamentals of functional programming language-ML, Schema.	Understand
CO6	Describe the fundamentals of logical Programming language- PROLOG.	Understand

SYLLABUS

UNIT I: SYNTAX AND SEMANTICS: Evolution of programming languages, describing syntax, context free grammars, attribute grammars, describing semantics, lexical analysis, parsing, recursive - decent bottom - up parsing

UNIT II: DATA, DATA TYPES, AND BASIC STATEMENTS: Names, variables, binding, type checking, scope, scope rules, lifetime and garbage collection, primitive data types, strings, array types, associative arrays, record types, union types, pointers and references, Arithmetic expressions, overloaded operators, type conversions, relational and Boolean expressions , assignment statements , mixed mode assignments, control structures – selection, iterations, branching, guarded Statements

UNIT III: SUBPROGRAMS AND IMPLEMENTATIONS: Subprograms, design issues, local referencing, parameter passing, overloaded methods, generic methods, design issues for functions, semantics of call and return, implementing simple subprograms, stack and dynamic local variables, nested subprograms, blocks, dynamic scoping

UNIT IV: OBJECT- ORIENTATION, CONCURRENCY, AND EVENT HANDLING: Object – orientation, design issues for OOP languages, implementation of object, oriented constructs, concurrency, semaphores, Monitors, message passing, threads, statement level concurrency, exception handling, event handling

UNIT V: FUNCTIONAL PROGRAMMING LANGUAGES: Introduction to lambda calculus, fundamentals of functional programming languages, Programming with Scheme, – Programming with ML,

UNIT VI: LOGIC PROGRAMMING LANGUAGES: Introduction to logic and logic programming, –Programming with Prolog, multi - paradigm languages

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Program Name: B.Tech Faculty Name: **CH.B.V.DURGA**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	II-II	Advanced Data Structures Lab	R1622057	19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

* **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
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Course Outcomes:

	Course Outcomes	Cognitive Levels
CO1	Construct linear and non-linear data structures for efficient traversals and data operation	Create

SYLLABUS

9. To perform various operations i.e., insertions and deletions on AVL trees.
10. To implement operations on binary heap.
9. Vertex insertion
10. Vertex deletion
11. Finding vertex
12. Edge addition and deletion

7. To implement Prim’s algorithm to generate a min-cost spanning tree.
8. To implement Krushkal’s algorithm to generate a min-cost spanning tree.
9. To implement Dijkstra’s algorithm to find shortest path in the graph.
10. To implementation of Static Hashing (Use Linear probing for collision resolution)
11. To implement of Huffmann coding.
12. To implement of B-tree

Program Name: B.Tech Faculty Name: **I.MURALI KRISHNA**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	II-II	Java Programming Lab	R1622058	19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

12 **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

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Course Outcomes:

Course Outcomes

	Course Outcomes	Cognitive Levels
CO1	Design Object Oriented applications using Java Programming Language	CREATE (K6)

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Exercise - 1 (Basics)

a). Write a JAVA program to display default value of all primitive data type of JAVA
b). Write a java program that display the roots of a quadratic equation ax2+bx=0. Calculate the discriminate D and basing on value of D, describe the nature of root.
c). Five Bikers Compete in a race such that they drive at a constant speed which may or may not be the same as the other. To qualify the race, the speed of a racer must be more than the average speed of all 5 racers. Take as input the speed of each racer and print back the speed of qualifying racers.

17. Write a case study on **public static void main(250 words) Exercise - 2** (Operations, Expressions, Control-flow, Strings)

5. . Write a JAVA program to search for an element in a given list of elements using binary search mechanism.

6. . Write a JAVA program to sort for an element in a given list of elements using bubble sort

(c). Write a JAVA program to sort for an element in a given list of elements using merge sort.

(d) Write a JAVA program using StringBufferto delete, remove character. **Exercise - 3** (Class, Objects)

19. . Write a JAVA program to implement class mechanism. – Create a class, methods and invoke them inside main method.

20. . Write a JAVA program to implement constructor. **Exercise - 4** (Methods)

25. . Write a JAVA program to implement constructor overloading.

26. . Write a JAVA program implement method overloading. **Exercise - 5** (Inheritance)

- . Write a JAVA program to implement Single Inheritance
- . Write a JAVA program to implement multi level Inheritance
- . Write a java program for abstract class to find areas of different shapes

Exercise - 6 (Inheritance - Continued)

- . Write a JAVA program give example for "super" keyword.
- . Write a JAVA program to implement Interface. What kind of Inheritance can be achieved?

Exercise - 7 (Exception)

5. .Write a JAVA program that describes exception handling mechanism

6. .Write a JAVA program Illustrating Multiple catch clauses

Exercise – 8 (Runtime Polymorphism)

2 . Write a JAVA program that implements Runtime polymorphism

3 . Write a Case study on run time polymorphism, inheritance that implements in above problem

Exercise – 9 (User defined Exception)

4. . Write a JAVA program for creation of Illustrating throw

5. . Write a JAVA program for creation of Illustrating finally

6. . Write a JAVA program for creation of Java Built-in Exceptions

7. .Write a JAVA program for creation of User Defined Exception

Exercise – 10 (Threads)

a). Write a JAVA program that creates threads by extending Thread class .First thread display "Good Morning "every 1 sec, the second thread displays "Hello "every 2 seconds and the third display "Welcome" every 3 seconds ,(Repeat the same by implementing Runnable)

b). Write a program illustrating **isAlive** and **join ()**

c). Write a Program illustrating Daemon Threads.

Exercise - 11 (Threads continuity)

a).Write a JAVA program Producer Consumer Problem

b).Write a case study on thread Synchronization after solving the above producer consumer problem

Exercise – 12 (Packages)

d). Write a JAVA program illustrate class path

e). Write a case study on including in class path in your os environment of your package.

c). Write a JAVA program that import and use the defined your package in the previous Problem
Exercise - 13 (Applet)
a).Write a JAVA program to paint like paint brush in applet.
a) Write a JAVA program to display analog clock using Applet.
c). Write a JAVA program to create different shapes and fill colors using Applet. **Exercise - 14** (Event Handling)
a).Write a JAVA program that display the x and y position of the cursor movement using Mouse.
b).Write a JAVA program that identifies key-up key-down event user entering text in a Applet.
Exercise - 15 (Swings)
a).Write a JAVA programto build a Calculator in Swings
b). Write a JAVA program to display the digital watch in swing tutorial.
Exercise – 16 (Swings - Continued)
a). Write a JAVA program that to create a single ball bouncing inside a JPanel. b). Write a JAVA program JTree as displaying a real tree upside down

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
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PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills. hardware

Course Outcomes:

Course Outcomes		Cognitive level
CO1	Design applications using Python	Create

Exercise 1 - Basics

8. Running instructions in Interactive interpreter and a Python Script
9. Write a program to purposefully raise Indentation Error and Correct it

Exercise 2 - Operations

d) Write a program to compute distance between two points taking input from the user (Pythagorean Theorem)

e) Write a program add.py that takes 2 numbers as command line arguments and prints its sum.

Exercise - 3 Control Flow

c) Write a Program for checking whether the given number is a even number or not.

d) Using a for loop, write a program that prints out the decimal equivalents of 1/2, 1/3, 1/4, . . . ,1/10

e) Write a program using a for loop that loops over a sequence. What is sequence ?

f) Write a program using a while loop that asks the user for a number, and prints a countdown from that number to zero.

Exercise 4 - Control Flow - Continued

b) Find the sum of all the primes below two million. Each new term in the Fibonacci sequence is generated by adding the previous two terms. By starting with 1 and 2, the first 10 terms will be: 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...

c) By considering the terms in the Fibonacci sequence whose values do not exceed four million, find the sum of the even-valued terms.

Exercise - 5 - DS

a) Write a program to count the numbers of characters in the string and store them in a dictionary data structure.

b) Write a program to use split and join methods in the string and trace a birthday with a dictionary data structure.

Exercise - 6 DS - Continued

a) Write a program combine lists that combines these lists into a dictionary.

b) Write a program to count frequency of characters in a given file. Can you use character frequency to tell whether the given file is a Python program file, C program file or a text file?

Exercise - 7 Files

a) Write a program to print each line of a file in reverse order.

b) Write a program to compute the number of characters, words and lines in a file.

Exercise - 8 Functions

a) Write a function ball_collide that takes two balls as parameters and computes if they are colliding. Your function should return a Boolean representing whether or not the balls are colliding. Hint: Represent a ball on a plane as a tuple of (x, y, r), r being the radius If (distance between two balls centers) <= (sum of their radii) then (they are colliding)

b) Find mean, median, mode for the given set of numbers in a list.

Exercise - 9 Functions - Continued

a) Write a function nearly_equal to test whether two strings are nearly equal. Two strings a and b are nearly equal when a can be generated by a single mutation on b.

b) Write a function dups to find all duplicates in the list.

c) Write a function unique to find all the unique elements of a list.

Exercise - 10 - Functions - Problem Solving

a) Write a function cumulative_product to compute cumulative product of a list of numbers.

b) Write a function reverse to reverse a list. Without using the reverse function.

c) Write function to compute gcd, lcm of two numbers. Each function shouldn’t exceed one line.

Exercise 11 - Multi-D Lists

a) Write a program that defines a matrix and prints

b) Write a program to perform addition of two square matrices

c) Write a program to perform multiplication of two square matrices

Exercise - 12 - Modules

a) Install packages requests, flask and explore them. using (pip)

b) Write a script that imports requests and fetch content from the page. Eg. (Wiki)

c) Write a simple script that serves a simple HTTP Response and a simple HTML Page

Exercise - 13 OOP

a) Class variables and instance variable and illustration of the self variable

i) Robot

ii) ATM Machine

Exercise - 14 GUI, Graphics

a) Write a GUI for an Expression Calculator using tk

b) Write a program to implement the following figures using turtle

Exercise - 15 - Testing

a) Write a test-case to check the even numbers which return True on Passing a list of all Even numbers

b) Write a test-case to check the Function reverse_string Which return the reversed String **Exercise - 16 - Advanced**

a) Build any one classical data structure

b) Write a program to solve knapsack Problem

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: B.Tech **Faculty Name: S.B.R.PRASAD**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	III-I	Compiler Design	R1631051	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4+1	Practical		Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
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11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Illustrate different language translators, phases in the design of compiler and specifying different types of tokens by lexical analyzer.	Understand
CO2	Design various top-down parsers like recursive descent parser, LL(1) parser.	Create
CO3	Design various bottom up parsers like SLR, CLR, and LALR Parsers.	Create
CO4	Develop syntax directed translation schemes and intermediate codes for grammars.	Create
CO5	Explain code generation & runtime storage organization.	Understand
CO6	Apply code optimization Techniques to improve the performance of a program in terms of speed & space.	Apply

Course Objectives:

20. Understand the basic concept of compiler design, and its different phases which will be helpful to construct new tools like LEX, YACC, etc.

UNIT – I

Introduction Language Processing, Structure of a compiler the evaluation of Programming language, The Science of building a Compiler application of Compiler Technology. Programming Language Basics. Lexical Analysis-: The role of lexical analysis buffing, specification of tokens. Recognitions of tokens the lexical analyzer generator lexical

UNIT –II

Syntax Analysis -: The Role of a parser, Context free Grammars Writing A grammar, top down passing bottom up parsing Introduction to Lr Parser.

UNIT –III

More Powerful LR parser (LR1, LALR) Using Armigers Grammars Equal Recovery in Lr parser Syntax Directed Transactions Definition, Evolution order of SDTS Application of SDTS. Syntax Directed Translation Schemes.

UNIT – IV

Intermediated Code: Generation Variants of Syntax trees 3 Address code, Types and Deceleration, Translation of Expressions, Type Checking. Canted Flow Back patching?

UNIT – V

Runtime Environments, Stack allocation of space, access to Non Local date on the stack Heap Management code generation – Issues in design of code generation the target Language Address in the target code Basic blocks and Flow graphs. A Simple Code generation.

UNIT –VI

Machine Independent Optimization. The principle sources of Optimization peep hole Optimization, Introduction to Date flow Analysi

Program Name: B.Tech **Faculty Name: VENU GOPAL**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	III-I	Unix Programming	R1631052	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4+1	Practical		Internal 30	External 70	3

Programme Outcomes:

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Programme Specific Outcomes:

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Course Objectives:

17. Written technical communication and effective use of concepts and terminology.
18. Facility with UNIX command syntax and semantics.
19. Ability to read and understand specifications, scripts and programs.
20. Individual capability in problem solving using the tools presented within the class. Students will demonstrate a mastery of the course materials and concepts within in class discussions.

UNIT-I

Introduction to unix-Brief History-What is Unix-Unix Components-Using Unix-Commands in Unix-Some Basic Commands-Command Substitution-Giving Multiple Commands.

UNIT-II

The File system –The Basics of Files-What's in a File-Directories and File Names-Permissions-I Nodes-The Directory Hierarchy, File Attributes and Permissions-The File Command knowing the File Type-The Chmod Command Changing File Permissions-The Chown Command Changing the Owner of a File-The Chgrp Command Changing the Group of a File.

UNIT-III

Using the Shell-Command Line Structure-Met characters-Creating New Commands-Command Arguments and Parameters-Program Output as Arguments-Shell Variables- -More on I/O Redirection-Looping in Shell Programs.

UNIT-IV

Filters-The Grep Family-Other Filters-The Stream Editor Sed-The AWK Pattern Scanning and processing Language-Good Files and Good Filters.

UNIT-V

Shell Programming-Shell Variables-The Export Command-The Profile File a Script Run During Starting-The First Shell Script-The read Command-Positional parameters-The $? Variable knowing the exit Status-More about the Set Command-The Exit Command-Branching Control Structures-Loop Control Structures-The Continue and Break Statement-The Expr Command: Performing

Integer Arithmetic-Real Arithmetic in Shell Programs-The here Document(<<The Sleep Command-Debugging Scripts-The Script Command-The Eval Command-The Exec Command.

UNIT-VI

The Process-The Meaning-Parent and Child Processes-Types of Processes-More about Foreground and Background processes-Internal and External Commands-Process Creation-The Trap Command-The Stty Command-The Kill Command-Job Control.

Program Name: B.Tech **Faculty Name: SK.AKABAR**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	III-I	Object Oriented Analysis and Design using UML	R1631053	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4+1	Practical		Internal 30	External 70	3

Programme Outcomes:

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- **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
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Course Objectives:

10. To understand how to solve complex problems
11. Analyze and design solutions to problems using object oriented approach
12. Study the notations of Unified Modeling Language

UNIT-I:

Introduction: The Structure of Complex systems, The Inherent Complexity of Software, Attributes of Complex System, Organized and Disorganized Complexity, Bringing Order to Chaos, Designing Complex Systems, Evolution of Object Model, Foundation of Object Model, Elements of Object Model, Applying the Object Model.

UNIT-II:

Classes and Objects: Nature of object, Relationships among objects, Nature of a Class, Relationship among Classes, Interplay of Classes and Objects, Identifying Classes and Objects, Importance of Proper Classification, Identifying Classes and Objects, Key abstractions and Mechanisms.

UNIT-III:

Introduction to UML: Why we model, Conceptual model of UML, Architecture, Classes, Relationships, Common Mechanisms, Class diagrams, Object diagrams.

UNIT-IV:

Basic Behavioral Modeling: Interactions, Interaction diagrams, Use cases, Use case Diagrams, Activity Diagrams. UNIT-V: Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

UNIT-VI:

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.
Case Study: The Unified Library application

Program Name: B.Tech **Faculty Name: V.NAVYA SREE**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	III-I	Database Management Systems	R1631054	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4+1	Practical		Internal 30	External 70	3

Programme Outcomes:

15. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
16. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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- \endash **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
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Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
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Course Outcomes:

CO #	Course outcome	Cognitive level
CO1	Understand functional components of the DBMS.	UNDETSTAND
CO2	Use the knowledge of basics of SQL and construct queries using SQL	APPLY
CO3	Design E-R model and database schema	CREATE
CO4	Apply the schema refinement concepts using normalization.	APP
CO5	Analyze transaction processing, concurrency control and recovery techniques	Analyze
CO6	Compare the basic database storage structures and access techniques: files, indexing methods including B tree,B+ tree and hashing.	UNDERSTAND

Course Objectives:

To learn the principles of systematically designing and using large scale Database Management Systems for various applications.

Unit – I: INTRODUCTION

Database system, Characteristics (Database Vs File System), Database Users (Actors on Scene, Workers behind thescene), Advantages of Data base systems, Database applications.

Brief introduction of different Data Models; Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence; Database system structure, environment, Centralized and Client Server architecture for the database.

Unit – II:

RELATIONAL MODEL : Introduction to relational model, concepts of domain, attribute, tuple, relation, importance of null values, constraints (Domain, Key constraints, integrity constraints) and their importance

BASIC SQL : Simple Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update), basic SQL querying (select and project) using where clause, arithmetic & logical operations, SQL functions(Date and Time, Numeric, String conversion).

Unit – III:

Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, constraints, sub classes, super class, inheritance, specialization, generalization using ER Diagrams.

SQL : Creating tables with relationship, implementation of key and integrity constraints, nested queries, sub queries, grouping, aggregation, ordering, implementation of different types of joins, view(updatable and non-updatable),relational set operations.

Unit – IV:

SCHEMA REFINEMENT (NORMALIZATION) : Purpose of Normalization or schema refinement, concept of functional dependency, normal forms based on functional dependency(1NF, 2NF and 3 NF), concept of surrogate key, Boyce-codd normal form(BCNF), Lossless join and dependency preserving decomposition, Fourth normal form(4NF).

Unit – V:

TRANSACTION MANAGEMENT AND CONCURRENCY CONTROL : Transaction, properties of transactions, transaction log, and transaction management with SQL using commit rollback and savepoint. Concurrency control for lost updates, uncommitted data, inconsistent retrievals and the Scheduler. Concurrency control with locking methods : lock granularity, lock types, two phase locking for ensuring serializability, deadlocks,Concurrency control with time stamp ordering : Wait/Die and Wound/Wait Schemes, Database Recovery management: Transaction recovery.
SQL constructs that grant access or revoke access from user or user groups. Basic PL/SQL procedures, functions and triggers.

UNIT – VI:

STORAGE AND INDEXING : Database file organization, file organization on disk, heap files and sorted files,hashing, single and multi-level indexes, dynamic multilevel indexing using B-Tree and B+ tree, index on multiple keys.

Program Name: B.Tech **Faculty Name: M.KALPANA**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	III-I	Operating Systems	R1631055	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4+1	Practical		Internal 30	External 70	3

Programme Outcomes:

12. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	**Fundamentals:** Be able to discuss the characteristics of different structures of the Operating Systems (such as microkernel, layered, virtualization, etc.) and identify the core functions of the Operating Systems	Understand
CO2	**Principles:** Be able to explain the principles and compare the algorithms on which the core functions of the Operating Systems are built on.	Understand
CO3	**Performance**: Be able to analyze and evaluate the algorithms of the core functions of the Operating Systems and explain the major performance issues with regard to the core functions.	Analyze
CO4	**Practicability:** Be able to demonstrate knowledge in applying system software and tools available in modernoperating system (such as threads, system calls, semaphores, etc.) for software development	Understand
CO5	Master issues related to file system interface and implementation, disk management	Create
CO6	Be familiar with various types of operating systems including Unix	Analyze

Course Objectives:

* Study the basic concepts and functions of operating systems.
* Understand the structure and functions of OS.
* Learn about Processes, Threads and Scheduling algorithms.
* Understand the principles of concurrency and Deadlocks.
* Learn various memory management schemes.
* Study I/O management and File systems.
* Learn the basics of Linux system and perform administrative tasks on Linux Servers.

UNIT I

Introduction to Operating System Concept: Types of operating systems, operating systems concepts, operating systems services, Introduction to System call, System call types.

UNIT-II:

Process Management – Process concept, The process, Process State Diagram , Process control block, Process Scheduling- Scheduling Queues, Schedulers, Operations on Processes, Interprocess Communication, Threading Issues, Scheduling-Basic Concepts, Scheduling Criteria, Scheduling Algorithms.

UNIT-III:

Memory Management: Swapping, Contiguous Memory Allocation, Paging, structure of the Page Table, Segmentation Virtual Memory Management: Virtual Memory, Demand Paging, Page-Replacement Algorithms, Thrashing

UNIT-IV:

Concurrency: Process Synchronization, The Critical- Section Problem, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization examples Principles of deadlock – System Model, Deadlock Characterization, Deadlock Prevention, Detection and Avoidance, Recovery form Deadlock

UNIT-V:

File system Interface- the concept of a file, Access Methods, Directory structure, File system mounting, file sharing, protection. File System implementation- File system structure, allocation methods, free-space management Mass-storage structure overview of Mass-storage structure, Disk scheduling, Device drivers,

UNIT VI:

Linux System: Components of LINUX, Interprocess Communication, Synchronization, Interrupt, Exception and System Call. Android Software Platform: Android Architecture, Operating System Services, Android Runtime Application Development, Application Structure, Application Process management

Program Name: B.Tech **FAculty Name: A.CHANDRA MOULI**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	III-I	UNIFIED MODELING LAB	R1631056	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory	Practical 3		Internal 25	External 50	2

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Objectives:

11. Construct UML diagrams for static view and dynamic view of the system.
12. Generate creational patterns by applicable patterns for given context.
13. Create refined model for given Scenario using structural patterns.
14. Construct behavioral patterns for given applications.

Week 1:

Familiarization with Rational Rose or Umbrello

For each case study:

Week 2, 3 & 4:

For each case study:

Identify and analyze events

Identify Use cases

Develop event table

Identify & analyze domain classes

Represent use cases and a domain class diagram using Rational Rose

Develop CRUD matrix to represent relationships between use cases and problem domain classes

Week 5 & 6:

For each case study:

13. Develop Use case diagrams

Develop elaborate Use case descriptions & scenarios

Develop prototypes (without functionality)

Develop system sequence diagrams

Week 7, 8, 9 & 10:

For each case study:

13. Develop high-level sequence diagrams for each use case

a. Identify MVC classes / objects for each use case
a. Develop Detailed Sequence Diagrams / Communication diagrams for each use case showing interactions among all the three-layer objects

16.Develop detailed design class model (use GRASP patterns for responsibility assignment) • e) Develop three-layer package diagrams for each case study

Week 11 & 12: • For each case study: •

18. Develop Use case Packages

19. Develop component diagrams

20. Identify relationships between use cases and represent them

21. Refine domain class model by showing all the associations among classes

Week 13 onwards: • For each case study:

7. Develop sample diagrams for other UML diagrams - state chart diagrams, activity diagrams and Develpoment.

Program Name: B.Tech **Faculty Name: M.KALPANA**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	III-I	OPERATING SYSEMS AND LINUX PROGRAMMING LAB	R1631057	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory	Practical 3		Internal 25	External 50	2

Programme Outcomes:

21. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
22. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
23. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
24. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
25. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
26. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
27. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
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31. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
32. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Bu using C, create different algorithms in operating systems, To use Unix utilities and perform basic shell control of the utilities, use the Unix file system and file access control and use of an operating system to develop software	Create
CO2	Students will be able to use Linux environment efficiently and Solve problems using bash for shell scripting	Create

Course Objectives:

27. To understand the design aspects of operating system.
28. To study the process management concepts & Techniques.
29. To study the storage management concepts.
30. To familiarize students with the Linux environment
31. To learn the fundamentals of shell scripting/programming
32. To conceptualize Data Mining and the need for pre-processing.
33. To learn the algorithms used for various types of Data Mining Problem

OPERATING SYSTEMS

- Simulate the following CPU scheduling algorithms

a) Round Robin b) SJF c) FCFS d) Priority

- Multiprogramming-Memory management- Implementation of fork (), wait (), exec() and exit (), System calls
- Simulate the following
- Multiprogramming with a fixed number of tasks (MFT)
- Multiprogramming with a variable number of tasks (MVT)

4. Simulate Bankers Algorithm for Dead Lock Avoidance
5. Simulate Bankers Algorithm for Dead Lock Prevention.
6. Simulate the following page replacement algorithms.
7. FIFO b) LRU c) LFU
7. Simulate the following File allocation strategies
4 Sequenced b) Indexed c) Linked

LINUX PROGRAMMING

1. a) Study of Unix/Linux general purpose utility command list
   man,who,cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date, time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown.
   Study of vi editor.
   Study of Bash shell, Bourne shell and C shell in Unix/Linux operating system.
   Study of Unix/Linux file system (tree structure).
   Study of .bashrc, /etc/bashrc and Environment variables.
   Write a C program that makes a copy of a file using standard I/O, and system calls
   Write a C program to emulate the UNIX ls –l command.
   Write a C program that illustrates how to execute two commands concurrently with a command pipe.
   Ex: - ls –l | sort

f) Write a C program that illustrates two processes communicating using shared memory
g) Write a C program to simulate producer and consumer problem using semaphores
h) Write C program to create a thread using p threads library and let it run its function.
i) Write a C program to illustrate concurrent execution of threads using p threads

Program Name: B.Tech **Faculty Name: V.NAVYA SREE**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	III-I	DATA BASE MANAGEMENT SYSTEM LAB	R1631058	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory	Practical 3		Internal 25	External 50	2

Programme Outcomes:

g) **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

h) **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

i) **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

j) **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

k) **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

l) **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

m) **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

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p) **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

q) **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

r) **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Outcomes:

CO #	Course outcome	Cognitive level
CO1	Design and Implement a database schema	create
CO2	Devise queries using DDL, DML, DCL and TCL commands	create
CO3	Develop application programs using PL/SQL	create

Course Objectives:

d) To provide a sound introduction to the discipline of database management as a subject in its own right, rather than as a compendium of techniques and product specific tools.
e) To familiarize the participant with the nuances of database environments towards an information-oriented data-processing oriented framework
f) To give a good formal foundation on the relational model of data
g) To present SQL and procedural interfaces to SQL comprehensively
h) To give an introduction to systematic database design approaches covering conceptual design, logical design and an overview of physical design

SQL

c) Queries to facilitate acquaintance of Built-In Functions, String Functions, Numeric Functions, Date Functions and Conversion Functions.
d) Queries using operators in SQL
e) Queries to Retrieve and Change Data: Select, Insert, Delete, and Update
f) Queries using Group By, Order By, and Having Clauses
g) Queries on Controlling Data: Commit, Rollback, and Save point
h) Queries to Build Report in SQL *PLUS
i) Queries for Creating, Dropping, and Altering Tables, Views, and Constraints
j) Queries on Joins and Correlated Sub-Queries
k) Queries on Working with Index, Sequence, Synonym, Controlling Access, and Locking Rows for Update, Creating Password and Security features

PL/SQL

c) Write a PL/SQL Code using Basic Variable, Anchored Declarations, and Usage of Assignment Operation
d) Write a PL/SQL Code Bind and Substitution Variables. Printing in PL/SQL
e) Write a PL/SQL block using SQL and Control Structures in PL/SQL
f) Write a PL/SQL Code using Cursors, Exceptions and Composite Data Types
g) Write a PL/SQL Code using Procedures, Functions, and Packages FORMS
h) Write a PL/SQL Code Creation of forms for any Information System such as Student Information System, Employee Information System etc. 18

Demonstration of database connectivity

Program Name: B.Tech **Faculty Name: B.SRIKANTH REDDY**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	III-I	Professional Ethics & Human Values	R1631049	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4+1	Practical		Internal 25	External 50	2

Programme Outcomes:

c) **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

d) **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

e) **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

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i) **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

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k) **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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Programme Specific Outcomes:

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PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
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Course Objectives:

b) To give basic insights and inputs to the student to inculcate Human values to grow as a responsible human beings with proper personality.
c) Professional Ethics instills the student to maintain ethical conduct and discharge their professional duties.

UNIT I: Human Values:
Morals, Values and Ethics – Integrity –Trustworthiness - Work Ethics – Service Learning – Civic Virtue – Respect for others – Living Peacefully – Caring – Sharing – Honesty –Courage – Value Time – Co-operation – Commitment – Empathy – Self-confidence – Spirituality-Character.

UNIT: II: Principles for Harmony: Truthfulness – Customs and Traditions -Value Education – Human Dignity – Human Rights – Fundamental Duties - Aspirations and Harmony (I, We & Nature) – Gender Bias – Emotional Intelligence – Salovey – Mayer Model – Emotional Competencies – Conscientiousness.

UNIT III: Engineering Ethics and Social Experimentation: History of Ethics - Need of Engineering Ethics - Senses of Engineering Ethics- Profession and Professionalism —Self Interest - Moral Autonomy – Utilitarianism – Virtue Theory - Uses of Ethical Theories - Deontology- Types of Inquiry –Kohlberg's Theory - Gilligan's Argument – Heinz's Dilemma - Comparison with Standard Experiments — Learning from the Past – Engineers as Managers – Consultants and Leaders – Balanced Outlook on Law - Role of Codes – Codes and Experimental Nature of Engineering.

UNIT IV: Engineers' Responsibilities towards Safety and Risk: Concept of Safety - Safety and Risk – Types of Risks – Voluntary v/sInvoluntary Risk – Consequences - Risk Assessment – Accountability – Liability - Reversible Effects – Threshold Levels of Risk - Delayed v/sImmediate Risk - Safety and the Engineer – Designing for Safety – Risk-Benefit Analysis-Accidents.

UNIT V: Engineers' Duties and Rights:
Concept of Duty - Professional Duties – Collegiality - Techniques for Achieving Collegiality – Senses of Loyalty - Consensus and Controversy - Professional and Individual Rights – Confidential and Proprietary Information - Conflict of Interest-Ethical egoism – Collective Bargaining – Confidentiality - Gifts and Bribes - Problem solving-Occupational Crimes- Industrial Espionage- Price Fixing-Whistle Blowing.

UNIT VI: Global Issues:
Globalization and MNCs –Cross Culture Issues - Business Ethics – Media Ethics - Environmental Ethics – Endangering Lives - Bio Ethics - Computer Ethics - War Ethics – Research Ethics -Intellectual Property Rights.

- Related Cases Shall be dealt where ever necessary.

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO
COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: B.Tech **Faculty Name: A. Chandra mouli**

Class	Semester	Title of The Paper	Paper Code	W.E.F
III CSE	II	DATA WARE HOUSING AND MINING	RT32052	19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

17. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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Programme Specific Outcomes:

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Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Explain the fundamentals of data mining and data warehousing	**Understand**
CO2	Apply the various data preprocessing techniques like data cleaning,data integration,data transformation,datareduction,data descretization and concept hierarchy generation.	**Apply**
CO3	Design of physical and logical data warehouses using OLAP technology.	**Create**
CO4	Design classification algorithm using decision tree induction including model overfitting	**Create**
CO5	Design the algorithm for frequent item set generation and FP-growth.	**Create**
CO6	Analyze various clustering algorithms like K-means ,agglomerative hierarichal clustering and DBSCAN.	**Analyze**

SYLLABUS

UNIT –I: Introduction: What Motivated Data Mining? Why Is It Important, Data Mining—On What Kind of Data, DataMining Functionalities—What Kinds of Patterns Can Be Mined? Are All of the Patterns Interesting? Classification of Data Mining Systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or Data Warehouse System, Major Issues in Data Mining

UNIT II: Data Pre-processing: Why Pre-process the Data? Descriptive Data Summarization, Data Cleaning, Data Integrationand Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation

UNIT III: Data Warehouse and OLAP Technology: An Overview: What Is a Data Warehouse? A Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data Warehousing to Data Mining. .

UNIT IV: Classification: Basic Concepts, General Approach to solving a classification problem, Decision Tree Induction:Working of Decision Tree, building a decision tree, methods for expressing an attribute test conditions, measures for selecting the best split, Algorithm for decision tree induction.
Model Over fitting: Due to presence of noise, due to lack of representation samples, evaluating the performance ofclassifier: holdout method, random sub sampling, and cross-validation, bootstrap

UNIT V: Association Analysis: Basic Concepts and Algorithms: Introduction, Frequent Item Set generation, Rulegeneration, compact representation of frequent item sets, FP-Growth Algorithm

UNIT VI Cluster Analysis: Basic Concepts and Algorithms: What Is Cluster Analysis? Different Types of Clustering,Different Types of Clusters, K-means, The Basic K-means Algorithm, K-means: Additional Issues, Bisecting K-means, K-means and Different Types of Clusters, Strengths and Weaknesses, K-means as an Optimization Problem, Agglomerative Hierarchical Clustering, Basic Agglomerative Hierarchical Clustering Algorithm, Specific Techniques, DBSCAN, Traditional Density: Center-Based Approach, The DBSCAN Algorithm, Strengths and Weaknesses

Program Name: B.Tech **Faculty Name: M.KALPANA**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	III-II	COMPUTER NETWORKS	RT32053	19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

21. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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Programme Specific Outcomes:

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Course Outcomes:

	Course Outcomes	Cognitive Levels
CO1	**Compare** different network models, and Network topologies.	Understand
CO2	**Contrast** multiplexing techniques and switching techniques	Understand
CO3	**Explain** Data link Layer Framing, Error control, Sliding Window Protocols like data link layer HDLC, point to point protocol (PPP).	Understand
CO4	**Explain** Random Access, Controlled Access, Channelization	Understand
CO5	**Explain** IEEE Standards, Standard Ethernet, Fast Ethernet, IEEE-802.11,	Understand
CO6	**Illustrate** Application layer protocols and Wireless Application Protocol	Understand

SYLLABUS

UNIT – I: Introduction: OSI overview, TCP/IP and other networks models, Examples of Networks: Novell Networks, Arpanet, Internet, Network Topologies WAN, LAN, MAN.

UNIT – II: Physical Layer and overview of PL Switching: Multiplexing: frequency division multiplexing, wave length division multiplexing, synchronous time division multiplexing, statistical time division multiplexing, introduction to switching: Circuit Switched Networks, Datagram Networks, Virtual Circuit Networks.

UNIT – III: Data link layer: Design issues, **Framing**: fixed size framing, variable size framing, flow control, error control, error detection and correction, CRC, Checksum: idea, one's complement internet checksum, services provided to Network Layer, **Elementary Data Link Layer protocols**: simplex protocol, Simplex stop and wait, Simplex protocol for Noisy Channel.
Sliding window protocol: One bit, Go back N, Selective repeat-Stop and wait protocol, Data link layer in HDLC: configuration and transfer modes, frames, control field, point to point protocol (PPP): framing transition phase, multiplexing, multi link PPP.

UNIT – IV: Random Access: ALOHA, MAC addresses, Carrier sense multiple access (CSMA), CSMA with Collision Detection, CSMA with Collision Avoidance, Controlled Access: Reservation, Polling, Token Passing, Channelization: frequency division multiple access(FDMA), time division multiple access(TDMA), code division multiple access(CDMA).
Network Layer: Virtual circuit and Datagram subnets-Routing algorithm shortest path routing, Flooding, Hierarchical routing, Broad cast, Multi cast, distance vector routing.

UNIT –V: IEEE Standards: – data link layer, physical layer, Manchester encoding, Standard Ethernet: MAC sub layer, physical layer, Fast Ethernet: MAC sub layer, physical layer, IEEE-802.11: Architecture, MAC sub layer, addressing mechanism, frame structure.

UNIT –VI:
Application layer (WWW and HTTP): ARCHITECTURE: Client (Browser), Server, Uniform Resource Locator HTTP: HTTP Transaction, HTTP Operational Model and Client/Server Communication, HTTP Generic Message Format, HTTP Request Message Format, HTTP Response Message Format **The wireless web :** WAP—The Wireless Application Protocol

Program Name: B.Tech **Faculty Name: V.S.R.K.PRASAD.G**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	III-II	DESIGN AND ANALYSIS OF ALGORITHMS	RT32054	19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

12. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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Programme Specific Outcomes:

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PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Classify the Characteristics of various problem analysis like Asymptotic, probabilistic, Amortized analysis.	Understand
CO2	Illustrate the complexities of various problems in Divide and Conquer design Strategies	Understand
CO3	Apply the greedy design techniques to various problems like knapsack, Spanning tree.	Apply
CO4	construct the problems using dynamic programming design strategy.	Create
CO5	Design back tracking technique for N-Queen, sum of subsets, graph coloring.	Create

SYLLABUS

UNIT-I: Introduction to Algorithm

Introduction: Algorithm, Pseudo code for expressing algorithms, performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, probabilistic analysis, Amortized analysis.

UNIT-II: Divide and conquer

General method, applications-Binary search, Quick sort, Merge sort

UNIT-III: Greedy method

General method, applications-Job sequencing with deadlines, knapsack problem, spanning trees, Minimum cost spanning trees, Single source shortest path problem.

UNIT-IV: Dynamic Programming

General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT-V: Backtracking

General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

UNIT-VI: Branch and Bound

General method, applications - Travelling sales person problem,0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

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Program Name: B.Tech **Faculty Name :B. Srikanth Reddy**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	III-II	IPR AND PATENTS		19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory	Practical 3	3	Internal 25	External 50	3

Programme Outcomes:

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Program Name: B.Tech **Faculty Name: M.Kalpana**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	III-II	COMPUTER NETWORKS AND NETWORK PROGRAMMING LAB	RT32057	19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

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Course Outcomes:

	Course Outcomes	Cognitive Levels
CO1	**I**mplement the data link layer and Network layer responsibilities like framing, Error Control (CRC) and Routing.	**Create**
CO2	Implement the forms of IPC. a)Pipes b)FIFO and file transfer using Message Queue form of IPC and implement shared memory concept	**Create**
CO3	Design TCP,UDP Client and server applications and RPC application	**Create**

SYLLABUS

Computer Networks & Network Programming Lab

PART – A

\endash **I**mplement the data link layer framing methods such as character stuffing and bit stuffing.

\endash Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP.

24. Implement Dijkstra‘s algorithm to compute the Shortest path thru a graph.
25. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table art each node using distance vector routing algorithm
26. Take an example subnet of hosts. Obtain broadcast tree for it.

* Implement the following forms of IPC. a)Pipes b)FIFO
* Implement file transfer using Message Queue form of IPC
* Write a programme to create an integer variable using shared memory concept and increment the variable
* simultaneously by two processes. Use senphores to avoid race conditions
* Design TCP iterative Client and server application to reverse the given input sentence
* Design TCP iterative Client and server application to reverse the given input sentence
* Design TCP client and server application to transfer file
* Design a TCP concurrent server to convert a given text into upper case using multiplexing system call “select”
* Design a TCP concurrent server to echo given set of sentences using poll functions
* Design UDP Client and server application to reverse the given input sentence
* Design UDP Client server to transfer a file
* Design using poll client server application to multiplex TCP and UDP requests for converting a given text into upper case.
* Design a RPC application to add and subtract a given pair of integers

Program Name: B.Tech **Faculty Name: V.NavyaSree**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE- A	III-II	SOFTWARE TESTING METHODOLOGIES		19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory	Practical 3	3	Internal 25	External 50	3

PROGRAM OUTCOMES (PO's)

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Program Educational Objectives (P.E.O's)

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PE03	Apply knowledge in the identification, design, development, production, configuration, and maintenance of computing systems, for real life problems.
PE04	Gain multidisciplinary knowledge through projects and industrial training, leading to a sustainable competitive edge in R&D,meeting societal needs, and as per the needs of the industry.
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SYLLABUS

UNIT I: Software Testing: Introduction, Evolution, Myths & Facts, Goals, Psychology, Definition, Model for testing, Effective Vs Exhaustive Software Testing.
Software Testing Terminology and Methodology: Software Testing Terminology, Software Testing Life Cycle, relating test life cycle to development life cycle Software Testing Methodology.

UNIT II:

Verification and Validation: Verification & Validation Activities, Verification, Verification of Requirements, High level and low level designs, How to verify code, Validation.
Dynamic Testing I: Black Box testing techniques: Boundary Value Analysis, Equivalence class Testing, State Table based testing, Decision table based testing, Cause-Effect Graphing based testing, Error guessing.

UNIT III:

Dynamic Testing II: White-Box Testing: need, Logic coverage criteria, Basis path testing, Graph matrices, Loop testing, data flow testing, mutation testing.
Static Testing: inspections, Structured Walkthroughs, Technical reviews

UNIT IV:

Validation activities: Unit testing, Integration Testing, Function testing, system testing, acceptance testing.
Regression testing: Progressives Vs regressive testing, Regression testability, Objectives of regression testing, When regression testing done? Regression testing types, Regression testing techniques

UNIT V:

Efficient Test Suite Management: Test case design why does a test suite grow, Minimizing the test suite and its benefits, test suite prioritization, Types of test case prioritization, prioritization techniques, measuring the effectiveness of a prioritized test suite Software Quality Management: Software Quality metrics, SQA models
Debugging: process, techniques, correcting bugs, Basics of testing management tools, test link and Jira.

UNIT VI:

Automation and Testing Tools: need for automation, categorization of testing tools, selection of testing tools, Cost incurred, Guidelines for automated testing, overview of some commercial testing tools.
Testing Object Oriented Software: basics, Object oriented testing.
Testing Web based Systems: Challenges in testing for web based software, quality aspects, web engineering, testing of web based systems, Testing mobile system

Program Name: B.Tech **Faculty Name: Srikanth Reddy**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE- B	III-II	SOFTWARE TESTING METHODOLOGIES		19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
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SYLLABUS

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Program Name: B.Tech **Faculty Name: V.Navyasree**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE- A	III-II	SOFTWARE TESTING METHODOLOGIES LAB		19-11-18

SYLLABUS

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Course Outcomes

CO#	Course Outcomes	Cognitive Levels
CO1	Design test cases for Black box and White box testing.	Create

SYLLABUS

Problem Statement 01

Consider an automated banking application. The user can dial the bank from a personal computer, provide a six-digit password, and follow with a series of keyword commands that activate the banking function. The software for the application accepts data in the following form:

Area Code	Blank or three-digit number
Prefix	Three-digit number, not beginning with 0 or 1
Suffix	Four-digit number
Password	Six-character alphanumeric
Commands	"Check status", "Deposit", "Withdrawal"

Design adhoc test cases to test the system.

Problem Statement 02

Consider an automated banking application. The user can dial the bank from a personal computer, provide a six-digit password, and follow with a series of keyword commands that activate the banking function. The software for the application accepts data in the following form:

Area Code	Blank or three-digit number
Prefix	Three-digit number, not beginning with 0 or 1
Suffix	Four-digit number
Password	Six-character alphanumeric
Commands	"Check status", "Deposit", "Withdrawal"

Design the test cases to test the system using following Black Box testing technique:
BVA, Worst BVA, Robust BVA, Robust Worst BVA
Equivalence class testing (Input/output domain)

Problem Statement 03

Consider an application that is required to validate a number according to the following simple rules:

22. A number can start with an optional sign.
23. The optional sign can be followed by any number of digits.
24. The digits can be optionally followed by a decimal point, represented by a period.
25. If there is a decimal point, then there should be two digits after the decimal.
26. Any number-whether or not it has a decimal point, should be terminated a blank.
27. A number can start with an optional sign.
28. The optional sign can be followed by any number of digits.
29. The digits can be optionally followed by a decimal point, represented by a period.
30. If there is a decimal point, then there should be two digits after the decimal.
31. Any number-whether or not it has a decimal point, should be terminated a blank. Generate test cases to test valid

and invalid numbers.
(HINT) Use Decision table and cause-effect graph to generate test cases.

<u>Problem Statement</u> 04

Generate test cases using Black box testing technique to Calculate Standard Deduction on Taxable Income. The standard deduction is higher for tax payers who are 65 or older or blind. Use the method given below to calculate tax.

8. The first factor that determines the standard deduction is the filing status. The basic standard deduction for the
various filing status are:
Single $4,750
Married, filing a joint return $9,500
Married, filing a separate return $7,000

9. If a married couple is filing separate returns and one spouse is not taking standard Deduction, the other spouse also is not eligible for standard deduction.

10. An additional $1,000 is allowed as standard deduction, if either the filer is 65 yrs or the spouse is 65 yrs or older
(the latter case applicable when the filing status is “Married” and filing “joint”).

11. An additional $1,000 is allowed as standard deduction, if either the filer is blind or the spouse is blind (the latter
case applicable when the filing status is
“married” and filing “joint”).

(HINT):
From the above description, it is clear that the calculation of standard deduction depends on the following 3 factors:

33. Status of filing of the filer
34. Age of the filer
35. Whether the filer is blind or not

In addition, in certain cases, the following additional factors also come into play in calculating the standard deduction.

34. Whether spouse has claimed standard deduction
35. Whether spouse is blind
36. Whether the spouse is more than 65 years old.

<u>Problem Statement</u> 05

Consider the following program segment:

- Int max (int i, int j, int k)
- {
- Int max;
- if (i>j) then
- if (i>k) then max=i;
- else max=k;
- else if (j > k) max=j
- else max=k

- return (max);
- }

8. Draw the control flow graph for this program segment
9. Determine the cyclomatic complexity for this program
10. Determine the independent paths.

<u>Problem Statement</u> 06

Source code of simple insertion sort implementation using array in ascending order in c programming language

```
#include<stdio.h>
int main(){
int i,j,s,temp,a[20];Printf ("Enter total elements:
"); Scanf ("%d",&s);
printf("Enter %d elements: ",s); for(i=0;i<s;i++) scanf("%d",&a[i]);
for(i=1;i<s;i++){ temp=a[i]; j=i-1; while((temp<a[j])&&(j>=0)){ a[j+1]=a[j]; j=j-1;

}
a[j+1]=temp;
}
printf("After sorting: ");
for(i=0;i<s;i++)
printf(" %d",a[i]);
return 0;
}
```

HINT: for loop is represented as while loop

5 Draw the program graph for given program segment b) Determine the DD path graph

10. Determine the independent paths
11. Generate the test cases for each independent path.

<u>Problem Statement</u> 07

Consider a system having an FSM for a stack having the following states and transitions:

States

Initial: Before creation

Empty: Number of elements = 0

Holding: Number of elements > 0, but less than the maximum capacity

Full: Number elements = maximum

Final: After destruction

Initial to Empty: Create

Empty to Holding, Empty to Full, Holding to Holding, Holding to Full: Add

Empty to Final, Full to Final, Holding to Final: Destroy

Holding to Empty, Full to Holding, Full to Empty: Delete

Design test cases for this FSM using state table-based testing.

<u>Problem Statement</u> 08

Given the following fragment of code, how many tests are required for 100% decision coverage?
Give the test cases.
if width > length
then biggest_dimension = width if height > width
then biggest dimension = height end_if
else if biggest dimension = length then if height >
length then biggest_dimension = height end_if end_if
end_if
Hint 04 test cases.

<u>Problem Statement</u> 09

Given the following code, how much minimum number of test cases is required for
full statement and branch coverage?read p read q If p+q> 100

then
print "Large"
endif
if p > 50
then
print "p Large"
endif
Hint 1 test for statement coverage, 2 for branch coverage.

<u>Problem Statement</u> 10

Consider a program to input two numbers and print them in ascending order given below.
Find all du paths and
identify those du-paths that are not feasible. Also find all dc paths and generate the test cases for all paths (dc paths
and non dc paths).
#include<stdio.h>
#include<conio.h>
f) void main ()
g) {
3 int a, b, t;
j) Clrscr ();
k) Printf (“Enter first number”);
l) scanf (“%d”,&a);
m) printf(“Enter second number”);
n) scanf(“%d”,&b);
o) if (a<b){
p) t=a;
11a=b;
12 b=t;

```
13}
s)   printf (“%d %d”, a, b);
i)   getch ();
}
```

Problem Statement 11

Consider the above program and generate possible program slices for all variables. Design at least one test case from every slice.

Problem Statement 12

Consider the code to arrange the nos. in ascending order. Generate the test cases for relational coverage, loop coverage and path testing. Check the adequacy of the test cases through mutation testing and also compute the mutation score for each. i = 0;

```
n=4; //N-Number of nodes present in the graph
While (i<n-1) do j = i + 1;
While (j<n) do
if A[i]<A[j] then swap (A[i], A[j]);
end do;
```

Program Name: B.Tech **Faculty Name: Dr.A.P.Sastri**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE- A	III-II	ARTIFICIAL INTELLIGENCE		19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory	Practical 3	3	Internal 25	External 50	3

PROGRAM OUTCOMES (PO's)

l) **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

m) **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

n) **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

o) **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

p) **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

q) **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

r) **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

s) **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

i) **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j) **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

k) **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

l) **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Educational Objectives (P.E.O's)

PE01	Acquire sound foundations in Basic Sciences and fundamentals in Engineering Sciences.
PE02	Analyze technical solutions to computational problems and develop efficient algorithms.
PE03	Apply knowledge in the identification, design, development, production, configuration, and maintenance of computing systems, for real life problems.
PE04	Gain multidisciplinary knowledge through projects and industrial training, leading to a sustainable competitive edge in R&D,meeting societal needs, and as per the needs of the industry.
PE05	Develop managerial skills, leadership quality and entrepreneurial spirit.
PE06	Inculcate healthy interpersonal skills and strong communication skills, as well as adherence to professional and ethical principles.

Program Specific Objectives (PSOs)

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

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Program Name: B.Tech **Faculty Name: S. Krishna Kishore**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	IV-I	Cryptography and Network Security	RT41051	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4+1	Practical	3	Internal 30	External 70	3

Programme Outcomes:

23. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
24. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
25. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
26. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

27. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
28. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
29. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

20. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
21. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
22. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
23. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
24. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Apply different Encryption Techniques to avoid threats and Attacks.	**Apply**
CO2	Illustrate various Symmetric key Cryptography Techniques like DES, AES, CAST, Blowfish, Feistel Cipher.	**Understand**
CO3	Illustrate various Asymmetric key Cryptography Techniques like RSA Algorithms, Diffie Hellman Key Exchange, Elgamal and ECC.	**Understand**
CO4	Explain about HMAC, CMAC Cryptographic Hash Functions and MD5, SSH Digital Signatures.	**Understand**
CO5	Summerize SSL, TLS, SSH under Transport Layer Security and PGP, MIME under Application Level Security .	**Understand**
CO6	Explain IP SECURITY and Intrusion detection systems	**Understand**

Course Objectives:

27. In this course the following principles and practice of cryptography and network security are covered:
28. Classical systems, symmetric block ciphers (DES, AES, other contemporary symmetric ciphers)
29. Public-key cryptography (RSA, discrete logarithms),
30. Algorithms for factoring and discrete logarithms, cryptographic protocols, hash functions, authentication, key management, key exchange, signature schemes,

5. Email and web security, viruses, firewalls, digital right management, and other topics.

UNIT- I:

Basic Principles

Security Goals, Cryptographic Attacks, Services and Mechanisms, Mathematics of Cryptography

UNIT- II:

Symmetric Encryption

Mathematics of Symmetric Key Cryptography, Introduction to Modern Symmetric Key Ciphers,Data Encryption Standard, Advanced Encryption Standard.

UNIT- III:

Asymmetric Encryption

Mathematics of Asymmetric Key Cryptography, Asymmetric Key Cryptography

UNIT- IV:

Data Integrity, Digital Signature Schemes & Key Management

Message Integrity and Message Authentication, Cryptographic Hash Functions, Digital Signature, Key Management.

UNIT -V:

Network Security-I

Security at application layer: PGP and S/MIME, Security at the Transport Layer: SSL and TLS

UNIT -VI:

Network Security-II

Security at the Network Layer: IPSec, System Security

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Program Name: B.Tech **Faculty Name: A.Chandramouli**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	IV –I	UML AND DESIGN PATTERNS	RT41052	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

30. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
31. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
32. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
33. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
34. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
35. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
36. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

19. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
20. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
21. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
22. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
23. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Model the unified process concepts and techniques for software projects.	Apply
CO2	Apply the uml patterns for their own designs in projects.	Apply
CO3	Construct OO Design using design patterns like GRASP and MVC layer.	Create
CO4	Construct OO Design using design patterns like Fabrication, Indirection, Singleton, Factory, Facade, and Publish-Subscribe.	Create
CO5	Design various UML models like use case diagrams, class diagrams, interaction diagrams, state chart diagrams, activity diagrams, and implementation diagrams.	Create
CO6	Explain data dependencies,packaging model,domain model refinement in social context .	understand

UNIT I : Introduction : Introduction to OOAD; typical activities / workflows / disciplines in OOAD, Introduction toiterative development and the Unified Process, Introduction to UML; mapping disciplines to UML artifacts, Introduction to Design Patterns - goals of a good design, Introducing a case study & MVC architecture

UNIT II: Inception: Artifacts in inception, Understanding requirements - the FURPS model, Understanding Use casemodel - introduction, use case types and formats, Writing use cases - goals and scope of a use case, elements / sections of a use case, Use case diagrams, Use cases in the UP context and UP artifacts, Identifying additional requirements, Writing requirements for the case study in the use case model

UNIT III: Elaboration: System sequence diagrams for use case model, Domain model : identifying concepts, addingassociations, adding attributes, Interaction Diagrams, Introduction to GRASP design Patterns ,Design Model: Use case realizations with GRASP patterns, Design Class diagrams in each MVC layer.

UNIT IV : More Design Patterns: Fabrication, Indirection, Singleton, Factory, Facade, Publish-Subscribe.

UNIT V: More UML diagrams : State-Chart diagrams, Activity diagrams, Component Diagrams, Deploymentdiagrams, Object diagrams

UNIT VI: Advanced concepts in OOAD : Use case relationships, GeneralizationsDomain Model refinements, Architecture, Packaging model elements

Program Name: B.Tech **Faculty Name: B.SARATH CHANDRA**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	IV-I	MOBILE COMPUTING	RT41053	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

26. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
27. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
28. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
29. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
30. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
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32. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

- **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Outcomes:

S.No	Course Outcomes	Cognitive Level
CO1	Illustrate the concept of mobile computing and its Architecture, subsystems of GSM, GPRS architecture, protocols and new data services.	Understand
CO2	Explain the MAC, SDMA, FDMA, TDMA, CDMA and Wireless LAN Protocols.	Understand
CO3	Discuss IP and Mobile IP Network Layer concepts such as handover & location management, Encapsulation, Route Optimization.	Understand
CO4	Discuss M-TCP, Indirect TCP , Snooping TCP Transport Layer protocols and database issues for mobile networks.	Understand
CO5	Explain the data Dissemination and Synchronization for mobile networks in asymmetric communication environment	Understand
CO6	Explain MANET including challenges, properties, applications, Routing Algorithms such as DSR, AODV, and DSDV, etc., and differentiatethe different protocols and platform for Mobile Computing.	Understand

Course Objectives:

25. To make the student understand the concept of mobile computing paradigm, its novel applications and limitations.
26. To understand the typical mobile networking infrastructure through a popular GSM protocol
27. To understand the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer
28. To understand the database issues in mobile environments & data delivery models.
29. To understand the ad hoc networks and related concepts.
30. To understand the platforms and protocols used in mobile environment

UNIT I

Introduction: Mobile Communications, Mobile Computing – Paradigm, Promises/Novel Applications and Impediments and Architecture; Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices. GSM – Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS.

UNIT –II

(Wireless) Medium Access Control (MAC): Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA, Wireless LAN/(IEEE 802.11)

UNIT –III

Mobile Network Layer : IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation, Route Optimization, DHCP.

UNIT –IV

Mobile Transport Layer : Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

Database Issues : Database Hoarding & Caching Techniques, Client-Server Computing & Adaptation, Transactional Models, Query processing, Data Recovery Process & QoS Issues.

UNIT V

Data Dissemination and Synchronization : Communications Asymmetry, Classification of Data Delivery Mechanisms, Data Dissemination, Broadcast Models, Selective Tuning and Indexing Methods, Data Synchronization – Introduction, Software, and Protocols.

UNIT VI

Mobile Ad hoc Networks (MANETs) : Introduction, Applications & Challenges of a MANET, Routing, Classification of Routing Algorithms, Algorithms such as DSR, AODV, DSDV, etc. , Mobile Agents, Service Discovery.

Protocols and Platforms for Mobile Computing : WAP, Bluetooth, XML, J2ME, JavaCard, PalmOS, Windows CE, SymbianOS, Linux for Mobile Devices,Android

Program Name: B.Tech **Faculty Name: B.SRIKANTH REDDY**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	IV-I	SOFTWARE TESTING METHODOLOGIES	RT41054	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

18. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
19. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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21. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
22. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
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24. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

32. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
33. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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35. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
36. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Outcomes:

CO#	Course Outcomes	Cognitive Levels
CO1	Explain software testing fundamentals and testing life cycle relating to development life cycle	Understand
CO2	Design the test cases for black box testing techniques like Boundary Value Analysis, Equivalence class Testing, State Table based testing, Decision table based testing, Cause-Effect Graphing based testing and Error guessing	Create
CO3	Design the test cases for white box testing like Logic coverage criteria, Basis path testing, Graph matrices, Loop testing, data flow testing and mutation testing and also for various static testing like inspections, Structured Walkthroughs and Technical reviews.	Create
CO4	Explain various validation activities like unit testing, Integration Testing, Function testing, system testing, acceptance testing and Regression testing	Understand
CO5	Discuss Test Suite Management , Software Quality Management and debugging processes.	Create
CO6	Explain automated testing ,Object oriented and Web based system testing.	Understand

UNIT I:

Software Testing: Introduction, Evolution, Myths & Facts, Goals, Psychology, Definition, Model for testing, Effective Vs Exhaustive Software Testing.

Software Testing Terminology and Methodology: Software Testing Terminology, Software Testing Life Cycle, relating test life cycle to development life cycle Software Testing Methodology.

UNIT II:

Verification and Validation: Verification & Validation Activities, Verification, Verification of Requirements, High level and low level designs, How to verify code, Validation.

Dynamic Testing I: Black Box testing techniques: Boundary Value Analysis, Equivalence class Testing, State Table based testing, Decision table based testing, Cause-Effect Graphing based testing, Error guessing.

UNIT III:

Dynamic Testing II: White-Box Testing: need, Logic coverage criteria, Basis path testing, Graph matrices, Loop testing, data flow testing, mutation testing.

Static Testing: inspections, Structured Walkthroughs, Technical reviews

UNIT IV:

Validation activities: Unit testing, Integration Testing, Function testing, system testing, acceptance testing.

Regression testing: Progressives Vs regressive testing, Regression testability, Objectives of regression testing, When regression testing done? Regression testing types, Regression testing techniques

UNIT V:

Efficient Test Suite Management: Test case design why does a test suite grow, Minimizing the test suite and its benefits, test suite prioritization, Types of test case prioritization, prioritization techniques, measuring the effectiveness of a prioritized test suite Software Quality Management: Software Quality metrics, SQA models

Debugging: process, techniques, correcting bugs, Basics of testing management tools, test link and Jira.

UNIT VI:

Automation and Testing Tools: need for automation, categorization of testing tools, selection of testing tools, Cost incurred, Guidelines for automated testing, overview of some commercial testing tools.

Testing Object Oriented Software: basics, Object oriented testing.

Testing Web based Systems: Challenges in testing for web based software, quality aspects, web engineering, testing of web based systems, Testing mobile systems

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Program Name: B.Tech **Faculty Name:A. Pathanjali Sastri**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	IV-I	SOFTWARE PROJECT MANAGEMENT	RT4105C	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

\endash **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

\endash **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

\endash **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

\endash **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

\endash **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

\endash **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

\endash **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

27. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
28. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
29. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
30. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
31. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Discuss the fundamental principles and challenges of Software Project management and Project Planning.	Understand
CO2	Describe various project life cycles, process artifacts and workflows in software project arena.	Understand
CO3	Implement different estimation techniques for Project Scheduling, tracking, Risk analysis, Quality management and Project Cost estimation.	Apply
CO4	Demonstrate effective project execution and control techniques that result in successful projects.	Apply
CO5	Demonstrate project planning activities that accurately forecast project costs, timelines, and quality. Implement processes for successful resource, communication, and risk and change management.	Apply
CO6	Distinguish and use the techniques for implementing quality management.	Analyze

Course Objectives:

* To study how to plan and manage projects at each stage of the software development life cycle (SDLC)
* To train software project managers and other individuals involved in software project planning and tracking and oversight in the implementation of the software project management process.
* To understand successful software projects that support organization's strategic goals

Unit I: Introduction: Project, Management, Software Project Management activities, Challenges in software projects, Stakeholders, Objectives & goalsProject Planning: Step-wise planning, Project Scope, Project Products & deliverables, Project activities, Effort estimation, Infrastructure

Unit II:
Project Approach: Lifecycle models, Choosing Technology, Protoyping, Iterative & incremental Process Framework: Lifecycle phases, Process Artifacts, Process workflows (Book 2

Unit III: Effort estimation & activity Planning:
Estimation techniques, Function Point analysis, SLOC, COCOMO, Usecase-based estimation , Activity Identification Approaches, Network planning models, Critical path analysis

Unit IV: Risk Management:
Risk categories, Identification, Assessment, Planning and management, PERT technique, Monte Carlo approach

Unit V: Project Monitoring & Control , Resource Allocation:
Creating a framework for monitoring & control, Progress monitoring, Cost monitoring, Earned value Analysis, Defects Tracking, Issues Tracking, Status reports, Types of Resources, Identifying resource requirements, Resource scheduling

Unit VI: Software Quality:
Planning Quality, Defining Quality - ISO 9016, Quality Measures, Quantitative Quality Management Planning, Product Quality & Process Quality
Metrics, Statistical Process Control Capability Maturity Model, Enhancing software Quality (Book3)

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Program Name: B.Tech **Faculty Name: A. Chandra Mouli**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	IV-I	UML AND DESIGN PATTERNS LAB	RT4105L	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	2

Programme Outcomes:

25. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
26. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
27. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
28. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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Programme Specific Outcomes:

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Design Patterns Lab

S. No Programs

21. Use case Diagram for Librarian Scenario
22. Using UML design Abstract factory design pattern
23. Using UML design Adapter-class Design pattern
24. Using UML design Adapter-object Design pattern
25. Using UML design Strategy Design pattern
26. Using UML design Builder Design pattern
27. Using UML design Bridge Design pattern
28. Using UML design Decorator Design pattern
29. User gives a print command from a word document. Design to represent this chain of responsibility Design pattern
30. Design a Flyweight Design pattern
31. Using UML design Facade Design pattern

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19. Using UML design Iterator Design pattern
20. Using UML design Mediator Design pattern
21. Using UML design Proxy Design pattern
22. Using UML design Visitor Design pattern

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POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY

VIJAYAWADA - 520 001.

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Program Name: B.Tech **Faculty Name: B.Charath Chandra**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	IV-I	MOBILE APPLICATION DEVELOPMENT LAB	RT4105M	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

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VIJAYAWADA - 520 001.
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Program Name: B.Tech **Faculty Name: B.SRIKANTH REDDY**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	IV-I	SOFTWARE TESTING LAB	RT4105N	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

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Course Outcomes:

CO#	**Course Outcomes**	**Cognitive Levels**
CO1	Design test cases for Black box and White box testing.	Create

<u>Problem Statement</u> 01

Consider an automated banking application. The user can dial the bank from a personal computer, provide a six-digit password, and follow with a series of keyword commands that activate the banking function. The software for the application accepts data in the following form:

Area Code	Blank or three-digit number
Prefix	Three-digit number, not beginning with 0 or 1
Suffix	Four-digit number
Password	Six-character alphanumeric
Commands	"Check status", "Deposit", "Withdrawal"

Design adhoc test cases to test the system.

<u>Problem Statement</u> 02

Consider an automated banking application. The user can dial the bank from a personal computer, provide a six-digit password, and follow with a series of keyword commands that activate the banking function. The software for the application accepts data in the following form:

Area Code	Blank or three-digit number
Prefix	Three-digit number, not beginning with 0 or 1
Suffix	Four-digit number
Password	Six-character alphanumeric
Commands	"Check status", "Deposit", "Withdrawal"

Design the test cases to test the system using following Black Box testing technique:
BVA, Worst BVA, Robust BVA, Robust Worst BVA
Equivalence class testing (Input/output domain)

<u>Problem Statement</u> 03

Consider an application that is required to validate a number according to the following simple rules:

36. A number can start with an optional sign.
37. The optional sign can be followed by any number of digits.
38. The digits can be optionally followed by a decimal point, represented by a period.
39. If there is a decimal point, then there should be two digits after the decimal.
40. Any number-whether or not it has a decimal point, should be terminated a blank.
41. A number can start with an optional sign.
42. The optional sign can be followed by any number of digits.
43. The digits can be optionally followed by a decimal point, represented by a period.
44. If there is a decimal point, then there should be two digits after the decimal.
45. Any number-whether or not it has a decimal point, should be terminated a blank. Generate test cases to test valid
and invalid numbers.

(HINT) Use Decision table and cause-effect graph to generate test cases.

<u>Problem Statement</u> 04

Generate test cases using Black box testing technique to Calculate Standard Deduction on Taxable Income. The standard deduction is higher for tax payers who are 65 or older or blind. Use the method given below to calculate tax.

37. The first factor that determines the standard deduction is the filing status. The basic standard deduction for the
various filing status are:
Single $4,750
Married, filing a joint return $9,500
Married, filing a separate return $7,000
38. If a married couple is filing separate returns and one spouse is not taking standard Deduction, the other spouse also is not eligible for standard deduction.

• An additional $1,000 is allowed as standard deduction, if either the filer is 65 yrs or the spouse is 65 yrs or older
(the latter case applicable when the filing status is “Married” and filing “joint”).
• An additional $1,000 is allowed as standard deduction, if either the filer is blind or the spouse is blind (the latter
case applicable when the filing status is
“married” and filing “joint”).
(HINT):
From the above description, it is clear that the calculation of standard deduction depends on the following 3 factors:
• Status of filing of the filer
• Age of the filer
• Whether the filer is blind or not
In addition, in certain cases, the following additional factors also come into play in calculating the standard deduction.
11. Whether spouse has claimed standard deduction
12. Whether spouse is blind
13. Whether the spouse is more than 65 years old.

Problem Statement 05

Consider the following program segment:

```
6  Int max (int i, int j, int k)
7  {
8  Int max;
9  if (i>j) then
10if (i>k) then max=i;
11else max=k;
12else if (j > k) max=j
13else max=k
14return (max);
15  }
```

12. Draw the control flow graph for this program segment
13. Determine the cyclomatic complexity for this program
14. Determine the independent paths.

Problem Statement 06

Source code of simple insertion sort implementation using array in ascending order in c programming language

```
#include<stdio.h>
int main(){
int i,j,s,temp,a[20];Printf ("Enter total elements:
"); Scanf ("%d",&s);
printf("Enter %d elements: ",s); for(i=0;i<s;i++) scanf("%d",&a[i]);
for(i=1;i<s;i++){ temp=a[i]; j=i-1; while((temp<a[j])&&(j>=0)){ a[j+1]=a[j];
```

```
j=j-1;
}
a[j+1]=temp;
}
printf("After sorting: ");
for(i=0;i<s;i++)
printf(" %d",a[i]);
return 0;
}
```

HINT: for loop is represented as while loop

h) Draw the program graph for given program segment b) Determine the DD path graph
q) Determine the independent paths
r) Generate the test cases for each independent path.

Problem Statement 07

Consider a system having an FSM for a stack having the following states and transitions:
States
Initial: Before creation
Empty: Number of elements = 0
Holding: Number of elements > 0, but less than the maximum capacity
Full: Number elements = maximum
Final: After destruction
Initial to Empty: Create
Empty to Holding, Empty to Full, Holding to Holding, Holding to Full: Add
Empty to Final, Full to Final, Holding to Final: Destroy
Holding to Empty, Full to Holding, Full to Empty: Delete
Design test cases for this FSM using state table-based testing.

Problem Statement 08

Given the following fragment of code, how many tests are required for 100% decision coverage? Give the test cases.
if width > length
then biggest_dimension = width if height > width
then biggest dimension = height end_if
else if biggest dimension = length then if height >
length then biggest_dimension = height end_if end_if
end_if
Hint 04 test cases.

Problem Statement 09

Given the following code, how much minimum number of test cases is required for
full statement and branch coverage?read p read q If p+q> 100

then
print "Large"
endif
if p > 50
then
print "p Large"
endif
Hint 1 test for statement coverage, 2 for branch coverage.

<u>Problem Statement</u> 10

Consider a program to input two numbers and print them in ascending order given below.
Find all du paths and
identify those du-paths that are not feasible. Also find all dc paths and generate the test cases for all paths (dc paths
and non dc paths).

```
#include<stdio.h>
#include<conio.h>
t) void main ()
u) {
3 int a, b, t;
j) Clrscr ();
k) Printf ("Enter first number");
l) scanf ("%d",&a);
m)      printf("Enter second number");
n) scanf("%d",&b);
o) if (a<b){
p)  t=a;
11a=b;
t)  b=t;
13}
m) printf ("%d %d", a, b);
o) getch ();
}
```

<u>Problem Statement 11</u>

Consider the above program and generate possible program slices for all variables. Design at least one test case from every slice.

<u>Problem Statement</u> 12

Consider the code to arrange the nos. in ascending order. Generate the test cases for relational coverage, loop coverage and path testing. Check the adequacy of the test cases through mutation testing and also compute the mutation score for each. i = 0;

n=4; //N-Number of nodes present in the graph

```
While (i<n-1) do j = i + 1;
While (j<n) do
if A[i]<A[j] then swap (A[i], A[j]);
end do;
```

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Program Name: B.Tech **Faculty Name: K.SUDHAKAR**

Class	Semester	Title of The Paper	Paper Code	W.E.F
CSE	IV-I	HADOOP AND BIGDATA LAB	RT4105O	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
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Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Design the Linked List, Stacks, Queues, Sets, and Maps using Java; the basic Word Count, weather data and Matrix Multiplication with Hadoop Map Reduce paradigm; scripts to sort, group, join, project, and filter data by using Pig; create, alter, and drop databases, tables, views, functions, and indexes by using Hive	Create
CO2	Design File management tasks by installing Hadoop Distributed File System (HDFS) architecture.	Create

Course Objectives:

d) Optimize business decisions and create competitive advantage with Big Data analytics
e) Introducing Java concepts required for developing map reduce programs
f) Derive business benefit from unstructured data
g) Imparting the architectural concepts of Hadoop and introducing map reduce paradigm
h) To introduce programming tools PIG & HIVE in Hadoop echo system

Week 1,2:

1. Implement the following Data structures in Java a)Linked Lists b) Stacks c) Queues d) Set e) Map
Week 3, 4:
d) (I) Perform setting up and Installing Hadoop in its three operating modes: Standalone, Pseudo distributed, Fully distributed
(ii)Use web based tools to monitor your Hadoop setup.
Week 5: 3. Implement the following file management tasks in Hadoop:
•Adding files and directories
•Retrieving files
•Deleting files
Hint: A typical Hadoop workflow creates data files (such as log files) elsewhere and copies them into HDFS using one of the above command line utilities.
Week 6:
d) Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm.
Week 7:
e) Write a Map Reduce program that mines weather data. Weather sensors collecting data every hour at many locations across the globe gather a large volume of log data, which is a good candidate for analysis with MapReduce, since it is semi structured and record-oriented.
Week 8:
f) Implement Matrix Multiplication with Hadoop Map Reduce
Week 9, 10:
g) Install and Run Pig then write Pig Latin scripts to sort, group, join, project, and filter your data.
Week 11, 12: 8. Install and Run Hive then use Hive to create, alter, and drop databases, tables, views, functions, and indexes

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Program Name: B.Tech **Faculty Name: S. Krishna Kishore**

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV CSE	II	CLOUD COMPUTING	RT42043E	19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4+1	Practical	3	Internal 30	External 70	3

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Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Demonstrate the environment in Distributed Systems for establishing Public & Private Clouds.	Understand
CO2	Experiment with Virtual Machines to form Clusters and Datacenters.	Apply
CO3	Illustrate Cloud Platform Architecture.	Understand
CO4	Make use of Google app engine with programming knowledge on Amazon AWS	Apply
CO5	Illustrate Scheduling algorithms and creation policies of Cloud	Understand
CO6	Distinguish various Storage Systems like DFS, GFS.	Apply

SYLLABUS

UNIT I: Systems modeling, Clustering and virtualization:

Scalable Computing over the Internet, Technologies for Network based systems, System models for Distributed and Cloud Computing, Software environments for distributed systems and clouds, Performance, Security And Energy Efficiency

UNIT II: Virtual Machines and Virtualization of Clusters and Data Centers:

Implementation Levels of Virtualization, Virtualization Structures/ Tools and mechanisms, Virtualization of CPU, Memory and I/O Devices, Virtual Clusters and Resource Management, Virtualization for Data Center Automation.

UNIT III: Cloud Platform Architecture:

Cloud Computing and service Models, Architectural Design of Compute and Storage Clouds, Public Cloud Platforms, Inter Cloud Resource Management, Cloud Security and Trust Management. Service Oriented Architecture, Message Oriented Middleware.

UNIT IV: Cloud Programming and Software Environments:

Features of Cloud and Grid Platforms, Parallel & Distributed Programming Paradigms, Programming Support of Google App Engine, Programming on Amazon AWS and Microsoft Azure, Emerging Cloud Software Environments.

UNIT V: Cloud Resource Management and Scheduling:

Policies and Mechanisms for Resource Management Applications of Control Theory to Task Scheduling on a Cloud, Stability of a Two Level Resource Allocation Architecture, Feedback Control Based on Dynamic Thresholds. Coordination of Specialized Autonomic Performance Managers, Resource Bundling, Scheduling Algorithms for Computing Clouds, Fair Queuing, Start Time Fair Queuing, Borrowed Virtual Time, Cloud Scheduling Subject to Deadlines, Scheduling MapReduce Applications Subject to Deadlines.

UNIT VI:

Storage Systems: Evolution of storage technology, storage models, file systems and database, distributed file systems, general parallel file systems. Google file system., Apache Hadoop, BigTable, Megastore, Amazon Simple Storage Service(S3)

Program Name: B.Tech **Faculty Name:K. Sudhakar**

Class	Semester	Title of The Paper	Paper Code	W.E.F
IVCSE	II	DISTRIBUTED SYSTEMS	RT42051	19-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

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Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Illustrate the Characteristics of Distributed Systems	Understand
CO2	Outline the Distributed Systems Architectural models and the Interprocess Communication	Understand
CO3	Analyze RMI in Java with Distributed Objects	Analyze
CO4	Explain the methods of process and threads with the structure of operating system layer	Understand
CO5	Discuss the architecture of the system with middle ware technologies.	Create
CO6	Analyze the mutual exclusion and communication with deadlocks and transaction recovery.	Analyze

SYLLABUS

UNIT-I: Characterization of Distributed Systems: Introduction, Examples of Distributed Systems, Resource Sharing and the Web, Challenges.

UNIT-II: System Models: Introduction, Architectural Models- Software Layers, System Architecture, Variations, Interface and Objects, Design Requirements for Distributed Architectures, Fundamental Models- Interaction Model, Failure Model, Security Model.

Interprocess Communication: Introduction, The API for the Internet Protocols- The Characteristics of Interprocess communication, Sockets, UDP Datagram Communication, TCP Stream Communication; External Data Representation and Marshalling; Client Server Communication; Group Communication- IP Multicast- an implementation of group communication, Reliability and Ordering of Multicast.

UNIT-III: Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects- Object Model, Distributed Object Modal, Design Issues for RMI, Implementation of RMI, Distributed Garbage Collection; Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI.

UNIT-IV: Operating System Support: Introduction, the Operating System Layer, Protection, Processes and Threads –Address Space, Creation of a New Process, Threads.

UNIT-V: Distributed File Systems: Introduction, File Service Architecture; Peer-to-Peer Systems: Introduction, Napster and its Legacy, Peer-to-Peer Middle-ware, Routing Overlays.

UNIT-VI: Coordination and Agreement: Introduction, Distributed Mutual Exclusion, Elections, And Multicast Communication. **Transactions & Replications:** Introduction, System Model and Group Communication, Concurrency Control in Distributed Transactions, Distributed Dead Locks, Transaction Recovery; Replication-Introduction, Passive (Primary) Replication, Active Replication

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
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Program Name: B.Tech **Faculty Name: S.ManiKanta**

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV CSE	II	MANAGEMENT SCIENCE	RT42052	19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

24. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
25. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
26. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
27. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
28. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
29. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
30. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
31. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
32. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

33. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
34. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
35. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Outcomes:

CO #	**Course outcome**	**Cognitive level**
CO1	Discuss the importance of the Management, Management Evolution, and its Functions and the Organization structure.	Understand
CO2	Implement the tasks, tools and underlying principles of operations management in the manufacturing and service sectors to improve organizational performance by understanding the roles and responsibilities of operations managers in different organisational contexts and administrative processes.	Apply
CO3	Implement appropriate HRM techniques to make informed decisions that enhance the effectiveness of the HR Manager by aligning the HRM strategy with the overall organizational strategy and purpose.	Apply
CO4	Generate the process of decision making and planning by using quantitative techniques like PERT, CPM and SPC.	Create
CO5	Determine the critical link among strategy, performance measurement, and risk management.	Apply
CO6	Implement relevant theories to critically examine contemporary management issues by applying the current management practices to contemporary management issues and challenges.	Apply

SYLLABUS

Unit I: Introduction to Management: Concept –nature and importance of Management – Functions of Management – Evaluation of Management thought- Theories of Motivation – Decision making process-Designing organization structure- Principles of organization - Types of organization structure.

Unit II: Operations Management: Principles and Types of Management – Work study- Statistical Quality Control- Control charts (P-chart, R-chart, and Cchart) Simple problems- Material Management: Need for Inventory control-EOQ, ABC analysis (simple problems) and Types of ABC analysis (HML, SDE, VED, and FSN analysis).

Unit III: Functional Management: Concept of HRM, HRD and PMIR- Functions of HR Manager- Wage payment plans(Simple Problems) – Job Evaluation and Merit Rating - Marketing Management- Functions of Marketing – Marketing strategies based on product Life Cycle, Channels of distributions.

Unit IV: Project Management: (PERT/CPM): Development of Network – Difference between PERT and CPM Identifying Critical Path- Probability- Project Crashing (Simple Problems)

Unit V: Strategic Management: Vision, Mission, Goals, Strategy – Elements of Corporate Planning Process – Environmental Scanning – SWOT analysis - Steps in Strategy Formulation and Implementation, Generic Strategy alternatives

Unit VI: Contemporary Management Practice: Basic concepts of MIS, MRP, Justin-Time(JIT) system, Total Quality Management(TQM), Six sigma and Capability Maturity Model(CMM) Levies, Supply Chain Management , Enterprise Resource Planning (ERP), Business Process outsourcing (BPO), Business process Re-engineering and Bench Marking, Balanced Score Card.

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Program Name: B.TECH **Faculty Name: B.HanumanthRao**

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV CSE	II	HUMAN COMPUTER INTERACTION	RT42053A	19-11-18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

- **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

31. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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34. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	**Practices of mathematical ideas:** By using mathematical techniques to solve problems using appropriate mathematical study, data structure and algorithms.
PSO2	**Practices Of Computing:** The students obtain the knowledge of hardware and software by the capability of attaining essential concepts from computing systems.
PSO3	**Practices of Software Development:** By possessing the computing skills and knowledge of software development life cycle, the students gain the practical capability and platform independent skills.

Course Outcomes:

CO#	Course Outcomes	Cognitive Levels
CO1	Illustrate interactive design process and universal design principles in designing HCI systems.	Understand
CO2	Discuss tasks and dialogs of relevant HCI systems based on task analysis and dialog design	Create
CO3	Illustrate Interaction devices, command and natural languages	Understand
CO4	Explain Quality of service, the Balancing function and fashion	Understand
CO5	Build User documentation and help manual for UI applications	Apply
CO6	Discuss information searching and visualization in UI.	Create

SYLLABUS

UNIT I:

Introduction: Usability of Interactive Systems- introduction, usability goals and measures, usability motivations, universal usability, goals for our profession

Managing Design Processes: Introduction, Organizational design to support usability, Four pillars of design, development methodologies, Ethnographic observation, Participatory design, Scenario Development, Social impact statement for early design review, legal issues, Usability Testing and Laboratories

UNIT II:

Menu Selection, Form Fill-In and Dialog Boxes: Introduction, Task- Related Menu Organization, Single menus, Combinations of Multiple Menus, Content Organization, Fast Movement Through Menus, Data entry with Menus: Form Fill-in, dialog Boxes, and alternatives, Audio Menus and menus for Small Displays

UNIT III:

Command and Natural Languages: Introduction, Command organization Functionality, Strategies and Structure, Naming and Abbreviations, Natural Language in Computing Interaction Devices: Introduction, Keyboards and Keypads, Pointing Devices, Speech and Auditory Interfaces, Displays- Small and large

UNIT IV:

Quality of Service: Introduction, Models of Response-Time impacts, Expectations and attitudes, User Productivity, Variability in Response Time, Frustrating Experiences

Balancing Function and Fashion: Introduction, Error Messages, Non anthropomorphic Design, Display Design, Web Page Design, Window Design, Color

UNIT V:

User Documentation and Online Help: Introduction, Online Vs Paper Documentation, Reading from paper Vs from Displays, Shaping the content of the Documentation, Accessing the Documentation, Online tutorials and animated documentation, Online communities for User Assistance, The Development Process

UNIT VI:

Information Search: Introduction, Searching in Textual Documents and Database Querying, Multimedia Document Searches, Advanced Filtering and Searching Interfaces

Information Visualization: Introduction, Data Type by Task Taxonomy, Challenges for Information Visualization

CSE-HOD

Principal

Program Name: MECH Faculty Name: Munira Begam/T. Santhi Sree

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	ENGLISH-I	R1611031	18/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
75 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

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PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

- To understand the basic fundamentals of Material science and Physical metallurgy. The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

Course Outcomes:

1.Summarize how self-introspection brings harmony and satisfaction.

2.Develop scientific attitude to solve many problems which we find difficult to tackle.
3.Analyze clearly and logically and write clearly and logically.
4.Agree that all men can come together and avert the peril.
5.Outline the formation of the planet and realize our place in the universe.
6.Develop humor and the use of words for irony.

SYLLABUS:

UNIT I:

1. 'Human Resources' from English for Engineers and Technologists.

UNIT 2:

1. ' Transport: Problems and Solutions' from English for Engineers and Technologists.

UNIT 3:

1. 'Evaluating Technology' from English for Engineers and Technologists.

UNIT 4:

1. 'Alternative Sources of Energy' from English for Engineers and Technologists.

UNIT 5:

1. 'Our Living Environment' from English for Engineers and Technologists.

UNIT 6:

1. ' Safety and Training' from English for Engineers and Technologists.

Program Name: MECH Faculty Name: D.RATNA BABU/SK AREEF

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	**MATHEMATICS-I**	R1611032	18/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
78 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

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PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

- ❖ To understand the basic fundamentals of Material science and Physical metallurgy. The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

Course Outcomes:

1.Classify differential equations by order linearity and homogeneity.
2.Solve linear equations with constant coefficients.
3.solve differential equations using Laplace transforms and inverses Laplace transforms.
4.Estimate the Maximum and Minimum of the function of two variables
5.Solve linear partial differential equations of both first and second order
6.solve linear second order PDEs by separation of variables, with applications to the wave, diffusion and Laplace's equations

SYLLABUS:

UNIT I: Differential equations of first order and first degree:

Linear-Bernoulli-Exact-Reducible to exact. Applications: Newton's Law of cooling-Law of natural growth and decay-Orthogonal trajectories- Electrical circuits- Chemical reactions.

UNIT II: Linear differential equations of higher order:

Non-homogeneous equations of higher order with constant coefficients with RHS term of the type e^{ax}, sin ax, cos ax, polynomials in x, e^{ax} V(x), xV(x)- Method of Variation of parameters.
Applications: LCR circuit, Simple Harmonic motion.

UNIT III: Laplace transforms:

Laplace transforms of standard functions-Shifting theorems - Transforms of derivatives and integrals – Unit step function –Dirac's delta function- Inverse Laplace transforms– Convolution theorem (with out proof). Applications: Solving ordinary differential equations (initial value problems) using Laplace transforms.

UNIT IV: Partial differentiation:

Introduction- Homogeneous function-Euler's theorem-Total derivative-Chain rule-Generalized Mean value theorem for single variable (without proof)-Taylor's and Mc Laurent's series expansion of functions of two variables– Functional dependence- Jacobian.
Applications: Maxima and Minima of functions of two variables without constraints and Lagrange's method (with constraints).

UNIT V: First order Partial differential equations:

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – solutions of first order linear (Lagrange) equation and nonlinear (standard types) equations.

UNIT VI: Higher order Partial differential equations:

Solutions of Linear Partial differential equations with constant coefficients. RHS term of the type e^{ax+by}, $\sin(ax+by)$, $\cos(ax+by)$, $x^m y^n$. Classification of second order partial differential equations.

Text Books:

1. B.S.Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.

2. N.P.Bali, Engineering Mathematics, Lakshmi Publications.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India

2. Micheael Greenberg, Advanced Engineering Mathematics, 9th edition, Pearson edn

3. Dean G. Duffy, Advanced engineering mathematics with MATLAB, CRC Press

4. Peter O'neil, Advanced Engineering Mathematics, Cengage Learning.

5. Srimanta Pal, Subodh C.Bhunia, Engineering Mathematics, Oxford University Press.

6. Dass H.K., Rajnish Verma. Er., Higher Engineering Mathematics, S. Chand Co. Pvt. Ltd, Delhi.

Program Name: MECH Faculty Name: G.ANURADHA/.S.SRAVYA

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	**ENGINEERING CHEMISTRY**	R1611033	18/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
72 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

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PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

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PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

- To understand the basic fundamentals of Material science and Physical metallurgy. The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

Course Outcomes:

1.Appraise the quality and utility of suitable water for industrial as well as domestic

applications.
2.Extrapolate the knowledge of cell, electrode, cathode, anode, electrolysis, electromotive force, reference electrode and batteries in chemical and other engineering areas.
3.Identify and evaluate different factors influencing corrosion and protection methods
4.Substantiate the utility of polymers in chemical and hardware industries. Inculcate knowledge of basic construction materials with its vital role.
5.Extrapolate the application of fuels in day to day life and to understand energy–related problems and solve them.
6.Explore the engineering applications of polymeric materials, cement, nano materials, liquid crystals, pv cells etc and Familiar with principle application of green chemistry and green synthesis

SYLLABUS:

UNIT I: HIGH POLYMERS AND PLASTICS

Polymerisation:- Introduction- Mechanism of polymerization - Stereo regular polymers – methods of polymerization (emulsion and suspension) -Physical and mechanical properties – ***Plastics*** as engineering materials : advantages and limitations – Thermoplastics and Thermosetting plastics – Compounding and fabrication (4/5 techniques)- Preparation, properties and applications of polyethene, PVC, Bakelite Teflon and Polycarbonates ***Elastomers :-*** Natural rubber- compounding and vulcanization – Synthetic rubbers : Buna S, Buna N, Thiokol and polyurethanes – Applications of elastomers.

Composite materials & Fiber reinforced plastics – Biodegradable polymers – Conducting polymers.

UNIT II: FUEL TECHNOLOGY

Fuels – Introduction – Classification – Calorific value - HCV and LCV – Dulong's formula – Bomb calorimeter – Numerical problems – Coal –– Proximate and ultimate analysis – Significance of the analyses – Liquid fuels – Petroleum- Refining – Cracking – Synthetic petrol –Petrol knocking – Diesel knocking - Octane and Cetane ratings – Anti-knock agents – Power alcohol – Bio-diesel – Gaseous fuels – Natural gas, LPG and CNG – Combustion – Calculation of air for the combustion of a fuel – Flue gas analysis – Orsat apparatus – Numerical problems on combustion. ***Explosives:-*** Rocket fuels.

UNIT III: ELECTROCHEMICAL CELLS AND CORROSION

Galvanic cells - Reversible and irreversible cells – Single electrode potential – Electro chemical series and uses of this series- Standard electrodes (Hydrogen and Calomel electrodes) - Concentration Cells – Batteries: Dry Cell - Ni-Cd cells - Ni-Metal hydride cells - Li cells - Zinc – air cells. ***Corrosion :-*** Definition – Theories of Corrosion (chemical & electrochemical) – Formation of galvanic cells by different metals, by concentration cells, by differential aeration and waterline corrosion – Passivity of metals – Pitting corrosion - Galvanic series – Factors which influence the rate of corrosion - Protection from corrosion –

Design and material selection – Cathodic protection - Protective coatings: – Surface preparation – Metallic (cathodic and anodic) coatings - Methods of application on metals (Galvanizing, Tinning, Electroplating, Electroless plating).

UNIT IV: CHEMISTRY OF ADVANCED MATERIALS

Nano materials:- Introduction – Sol-gel method & chemical reduction method of preparation – Characterization by BET method and TEM methods - Carbon nano tubes and fullerenes: Types, preparation, properties and applications ***Liquid crystals:-*** Introduction – Types – Applications ***Super conductors:-***Type – I, Type II – Characteristics and applications

Green synthesis:- Principles - 3or 4 methods of synthesis with examples – R_4M_4 principles

UNIT V: WATER TECHNOLOGY

Hard water:- Reasons for hardness – units of hardness - determination of hardness and alkalinity - Water for steam generation - Boiler troubles – Priming and Foaming, Scale formation, Boiler corrosion, Caustic embrittlement - Internal treatments - Softening of Hard water : Lime – Soda process, Zeolite process and numerical problems based on these processes and Ion Exchange process - Water for drinking purposes- Purification – Sterilization and disinfection : Chlorination, Break point chlorination and other methods – Reverse Osmosis and Electro Dialysis.

UNIT VI: CHEMISTRY OF ENGINEERING MATERIALS AND FUEL CELLS

Refractories: - Definition, characteristics, classification, properties, failure of refractories

Lubricants: - Definition, function, Theory and mechanism of lubricants, properties (Definition and importance) ***Cement: -*** Constituents, manufacturing, hardening and setting, deterioration of cement ***Insulators: -*** Thermal and electrical insulators ***Fuel cells: -*** Hydrogen Oxygen fuel cells – Methanol Oxygen fuel cells **Outcome:** The advantages and limitations of plastic materials and their use in design would be understood. Fuels which are used commonly and their economics, advantages and limitations are discussed. Reasons for corrosion.

and some methods of corrosion control would be understood. The students would be now aware of materials like nano materials and fullerenes and their uses. Similarly liquid crystals and superconductors are understood. The importance of green synthesis is well understood and how they are different from conventional methods is also explained. The impurities present in raw water, problems associated with them and how to avoid them are understood. The advantages and limitations of plastic materials and their use in design would be understood. The commonly used industrial materials are introduced.

Standard Books:

1. Engineering Chemistry by Jain and Jain; Dhanpat Rai Publicating Co.
2. Engineering Chemistry by Shikha Agarwal; Cambridge University Press, 2015 edition.

Reference Books:

1. Engineering Chemistry of Wiley India Pvt. Ltd., Vairam and others, 2014 edition (second).

2. Engineering Chemistry by Prasanth Rath, Cengage Learning, 2015 edition.

3. A text book of engineering Chemistry by S. S. Dara; S. Chand & Co Ltd., Latest Edition

4. Applied Chemistry by H.D. Gesser, Springer Publishers

5. Text book of Nano-science and nanotechnology by B.S. Murthy, P. Shankar and others, University Press, IIM

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Program Name: MECH Faculty Name: N.V.MALAVIKA/V.CHANDRIKA

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	**ENIGINEERING MECHANICS**	R1611032	18/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
75 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

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PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

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PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

- ❖ To understand the basic fundamentals of Material science and Physical metallurgy. The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

Course Outcomes:

1.Determine resultants of different force systems.
2.Apply conditions of static equilibrium to plane force systems
3.Determine centroid and center of gravity of composite bodies
4.Determine Moment of inertia and Mass moment of inertia of composite bodies
5.Solve problems in kinematic and dynamic systems
6.Calculate work, energy for different systems.

SYLLABUS:

UNIT – I

Introduction to Engg. Mechanics – Basic Concepts. **Systems of Forces:** Coplanar Concurrent Forces – Components in Space – Resultant – Moment of Force and its Application – Couples and Resultant of Force Systems. **Friction:** Introduction**,** limiting friction and impending motion, coulomb's laws of dry friction, coefficient of friction, cone of friction

UNIT II

Equilibrium of Systems of Forces: Free Body Diagrams, Equations of Equilibrium of Coplanar Systems, Spatial Systems for concurrent forces. Lamis Theorem, Graphical method for the equilibrium of coplanar forces, Converse of the law of Triangle of forces, converse of the law of polygon of forces condition of equilibrium, analysis of plane trusses.

UNIT – III

Centroid: Centroids of simple figures (from basic principles) – Centroids of Composite Figures

Centre of Gravity: Centre of gravity of simple body (from basic principles), centre of gravity of composite bodies, Pappus theorems.

UNIT IV

Area moments of Inertia: Definition – Polar Moment of Inertia, Transfer Theorem, Moments of Inertia of Composite Figures, Products of Inertia, Transfer Formula for Product of Inertia. **Mass Moment of Inertia:** Moment of Inertia of Masses, Transfer Formula for Mass Moments of Inertia, mass moment of inertia of composite bodies.

UNIT – V

Kinematics: Rectilinear and Curvelinear motions – Velocity and Acceleration – Motion of Rigid Body – Types and their Analysis in Planar Motion. **Kinetics:** Analysis as a Particle and Analysis as a Rigid Body in Translation – Central Force Motion – Equations of Plane Motion – Fixed Axis Rotation – Rolling Bodies.

UNIT – VI

Work – Energy Method: Equations for Translation, Work-Energy Applications to Particle Motion, Connected System-Fixed Axis Rotation and Plane Motion. Impulse momentum method.

TEXT BOOKS :

1. Engg. Mechanics - S.Timoshenko & D.H.Young., 4th Edn - , Mc Graw Hill publications.

REFERENCES :

1. Engineering Mechanics statics and dynamics – R.C.Hibbeler, 11th Edn – Pearson Publ.
2. Engineering Mechanics, statics – J.L.Meriam, 6th Edn – Wiley India Pvt Ltd.
3. Engineering Mechanics, statics and dynamics – I.H.Shames, – Pearson Publ.
4. Mechanics For Engineers, statics - F.P.Beer & E.R.Johnston – 5th Edn Mc Graw Hill Publ.
5. Mechanics For Engineers, dynamics - F.P.Beer & E.R.Johnston –5th Edn Mc Graw Hill Publ.
6. Theory & Problems of engineering mechanics, statics & dynamics – E.W.Nelson, C.L.Best & W.G. McLean, 5th Edn – Schaum's outline series - Mc Graw Hill Publ.
7. Singer's Engineering Mechanics: Statics And Dynamics, K. Vijay Kumar Reddy, J. Suresh Kumar, Bs Publications
8. Engineering Mechanics, Fedinand . L. Singer, Harper – Collins.
9. Engineering Mechanics statics and dynamics , A Nelson , Mc Graw Hill publications

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Program Name: MECH Faculty Name: O.SRAVANI/M.UDAYA TEJASWINI

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	**COMPUTER PROGRAMMING**	R1611032	18/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
68 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

- ❖ To understand the basic fundamentals of Material science and Physical metallurgy. The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

Course Outcomes:

1.Design algorithms using fundamentals concepts of computer system Using different data types, operators and standard library functions.
2.Design applications involving the control flow statements
3.Design a case study involving modular programming
4.Design application involving arrays and strings
5.Design applications using structures, unions, pointers .
6.Design applications using file system concepts.

1.

SYLLABUS:

UNIT-I:

History and Hardware - Computer Hardware, Bits and Bytes, Components, Programming Languages – Machine Language, Assembly Language, Low- and High-Level Languages, Procedural and Object-Oriented Languages, Application and System Software, The Development of C Algorithms The Software Development Process.

UNIT-II:

Introduction to C Programming- Identifiers, The main () Function, The printf () Function

Programming Style - Indentation, Comments, Data Types**,** Arithmetic Operations, Expression Types, Variables and Declarations, Negation, Operator Precedence and Associativity, Declaration Statements, Initialization.

Assignment - Implicit Type Conversions, Explicit Type Conversions (Casts), Assignment Variations, Mathematical Library Functions, Interactive Input, Formatted Output, Format Modifiers.

UNIT -III:

Control Flow-Relational Expressions - Logical Operators:

Selection: if-else Statement, nested if, examples, Multi-way selection: switch, else-if, examples.

Repetition: Basic Loop Structures, Pretest and Posttest Loops, Counter-Controlled and Condition-Controlled Loops, The while Statement, The for Statement, Nested Loops, The do-while Statement.

UNIT-IV

Modular Programming: Function and Parameter Declarations, Returning a Value, Functions with Empty Parameter Lists, Variable Scope, Variable Storage Class, Local Variable Storage Classes, Global Variable Storage Classes, Pass by Reference, Passing Addresses to a Function, Storing Addresses, Using Addresses, Declaring and Using Pointers, Passing Addresses to a Function. Case Study: Swapping Values, Recursion - Mathematical Recursion, Recursion versus Iteration.

UNIT-V:

Arrays & Strings

Arrays: One-DimensionalArrays, Input and Output of Array Values, Array Initialization, Arrays as Function Arguments, Two-Dimensional Arrays, LargerDimensionalArrays- Matrices

Strings: String Fundamentals, String Input and Output, String Processing, Library Functions

UNIT-VI:

Pointers, Structures, Files

Pointers: Concept of a Pointer, Initialization of pointer variables, pointers as function arguments, passing by address, Dangling memory, address arithmetic, character pointers and functions, pointers to pointers, Dynamic memory management functions, command line arguments.

Structures: Derived types, Sstructures declaration, Initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bit-fields.

Data Files: Declaring, Opening, and Closing File Streams, Reading from and Writing to Text Files, Random File Access

Text Books:

1. ANSI C Programming, Gary J. Bronson, Cengage Learning.
2. Programming in C, Bl Juneja Anita Seth, Cengage Learning.
3. The C programming Language, Dennis Richie and Brian Kernighan, Pearson Education.

Reference Books:

1. C Programming-A Problem Solving Approach, Forouzan, Gilberg, Cengage.
2. Programming with C, Bichkar, Universities Press.
3. Programming in C, ReemaThareja, OXFORD.
4. C by Example, Noel Kalicharan, Cambridge.

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Program Name: MECH Faculty Name: K.SURYA KUMARI

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	**ENVIRONMENTAL STUDIES**	R1611032	18/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
68 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

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Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

- ❖ To understand the basic fundamentals of Material science and Physical metallurgy. The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

Course Outcomes:

1.Classify various environmental challenges induced due to unplanned anthropogenic activities.

2.To provide basic knowledge on ecosystems; its diversity and protection methods. Role of food webs and food chains in an ecosystem.
3.Illustrate natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources
4.Illustrate the biodiversity of India and the threats to biodiversity and conservation practices to protect the biodiversity
5.Explain the role of individual in minimizing pollution and management of wastes.
6.Explain the knowledge of environmental legislation and urban related problems
7.Explain the knowledge of environmental management and green concepts.

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SYLLABUS:

UNIT – I

Multidisciplinary nature of Environmental Studies: Definition, Scope and Importance – Sustainability: Stockholm and Rio Summit–Global Environmental Challenges: Global warming and climate change, Carbon Credits, acid rains, ozone layer depletion, population growth and explosion, effects. Role of information Technology in Environment and human health.

ENVIRONMENTAL STUDIES

Ecosystems: Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems.

UNIT – II Natural Resources: Natural resources and associated problems

Forest resources – Use and over – exploitation, deforestation – Timber extraction – Mining, dams and other effects on forest and tribal people Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, Sustainable mining of Granite, Literate, Coal, Sea and River sands.

Food resources: World food problems, changes caused by non-agriculture activities-effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy

sources Vs Oil and Natural Gas Extraction. Land resources: Land as a resource, land degradation, Wasteland reclamation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources

for sustainable lifestyles.

UNIT – III Biodiversity and its conservation: Definition: genetic, species and ecosystem diversityclassification - Value of biodiversity: consumptive use, productive use, social-Biodiversity at national and local levels. India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, manwildlife conflicts - Endangered and endemic species of India – Conservation of biodiversity: conservation of biodiversity.

UNIT – IV Environmental Pollution: Definition, Cause, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution, Nuclear hazards. Role of an individual in prevention of pollution. - Pollution case studies, Sustainable Life Studies. Impact of Fire Crackers on Men and his well being. **Solid Waste Management:** Sources, Classification, effects and control measures of urban and industrial solid wastes. Consumerism and waste products, Biomedical, Hazardous and e – waste management.

UNIT – V Social Issues and the Environment: Urban problems related to energy -Water conservation, rain water harvesting-Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issues and possible solutions. Environmental Protection Act -Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act-Issues involved in enforcement of environmental legislation. -Public awareness.

UNIT – VI Environmental Management: Impact Assessment and its significance various stages of EIA, preparation of EMP and EIS, Environmental audit. Ecotourism, Green Campus – Green business and Green politics. The student should Visit an Industry / Ecosystem and submit a report individually on any issues related to Environmental Studies course and make a power point presentation.

TEXT BOOKS:

1. Environmental Studies, K. V. S. G. Murali Krishna, VGS Publishers, Vijayawada

2. Environmental Studies, R. Rajagopalan, 2nd Edition, 2011, Oxford University Press.

3.Environmental Studies, P. N. Palanisamy, P. Manikandan, A. Geetha, and K. Manjula Rani; Pearson Education, Chennai

REFERENCE:

1. Text Book of Environmental Studies, Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.

2. A Textbook of Environmental Studies, Shaashi Chawla, TMH, New Delhi

3. Environmental Studies, Benny Joseph, Tata McGraw Hill Co, New Delhi

4. Perspectives in Environment Studies, Anubha Kaushik, C P Kaushik, New Age International Publishers, 2014

Program Name: ME-A&B Faculty Name: MUNIRA BEGUM/T.SANTHI SREE

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	**ENGLISH COMMUNICATION SKILLS LAB-I**	RT21038	18/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
36 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

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PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Specify, architect, design and analyze systems that efficiently generate, transmit, distribute and utilize electrical power.

PSO2. Analyze and design modern electrical drive systems and modern lighting systems.

PSO3. Understand the principles and construction of electrical machines and determine their performance through testing.

PSO4. Specify, design, implement and test analog and embedded signal processing electronic systems using the state of the art components and software tools.

Course Objectives:

Course Objective: To impart practical exposure on the microstructures of various materials and their hardness evaluation. Also to impart practical knowledge on the evaluation of material properties through various destructive testing procedures.

Course Outcomes:

1.Relate himself with G.D.Naidu to become successful entrepreneurs.
2.How grit and determination can take a common man to heights
3.Apply interest in multiple fields of knowledge and social service to make life worthy.
Invent new things by emulating Vijay Bhatkar.

SYLLABUS:

UNIT 1:

1. WHY study Spoken English?
2. Making Inqueries on the phone, thanking and responding to Thanks

Practice work.

UNIT 2:

1. Responding to Requests and asking for Directions, Practice work.

UNIT 3:

1. Asking for Clarifications, Inviting, Expressing Sympathy, Congratulating
2. Apologising, Advising, Suggesting, Agreeing and Disagreeing

Practice work.

UNIT 4:

1. Letters and Sounds, Practice work.

UNIT 5:

1. The Sounds of English, Practice work.

UNIT 6:

1. Pronunciation
2. Stress and Intonation

Practice work.

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Program Name: ME-A&B Faculty Name: G.ANURADHA/.S.SRAVYA

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	**ENGINEERING/ APPLIED CHEMISTRY LAB**	RT21038	18/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
36 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

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PSO4. Specify, design, implement and test analog and embedded signal processing electronic systems using the state of the art components and software tools.

Course Objectives:

Course Objective: To impart practical exposure on the microstructures of various materials and their hardness evaluation. Also to impart practical knowledge on the evaluation of material properties through various destructive testing procedures.

Course Outcomes:

1.Develop knowledge on analysis with basic concepts of morality, normality, morality, mole fractions
2.Determine the quality of food and water using neutralization titration
3.Appraise the quality of a product or water using complex metric titration.
4.Determine the quantity of ions in the sample using precipitation titration.
5.Analyze pH of the given samples.
6.Estimate quality of food and water based on conductivity and potential samples

LIST OF EXPERIMENTS:

1. Introduction to Chemistry laboratory – Molarity, Normality, Primary, secondary standard solutions, Volumetric titrations, Quantitative analysis, Qualitative analysis, etc.
2. Trial experiment - Determination of HCl using standard Na_2CO_3 solution.
3. Determination of alkalinity of a sample containing Na_2CO_3 and NaOH.
4. Determination of $KMnO_4$ using standard Oxalic acid solution.
5. Determination of Ferrous iron using standard $K_2Cr_2O_7$ solution.
6. Determination of Copper using standard $K_2Cr_2O_7$ solution.
7. Determination of temporary and permanent hardness of water using standard EDTA solution.
8. Determination of Copper using standard EDTA solution.
9. Determination of Iron by a Colorimetric method using thiocyanate as reagent.
10. Determination of pH of the given sample solution using pH meter.
11. Conductometric titration between strong acid and strong base.
12. Conductometric titration between strong acid and weak base.
13. Potentiometric titration between strong acid and strong base.
14. Potentiometric titration between strong acid and weak base.
15. Determination of Zinc using standard EDTA solution.
16. Determination of Vitamin – C.

Reference Books

1. A Textbook of Quantitative Analysis, Arthur J. Vogel.
2. Dr. Jyotsna Cherukuris (2012) *Laboratory Manual of engineering chemistry-II,* VGS Techno Series
3. Chemistry Practical Manual, Lorven Publications
4. K. Mukkanti (2009) *Practical Engineering Chemistry,* B.S. Publication

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Program Name: ME-A&B   Faculty Name: B.RAJESH KUMAR/ M.UDAYA TEJASWINI

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	**C-PROGRAMMING LAB**	RT21038	18/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
36 Hours	Theory	Practical 3	3	Internal 25	External 50	2

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Course Objective: To impart practical exposure on the microstructures of various materials and their hardness evaluation. Also to impart practical knowledge on the evaluation of material properties through various destructive testing procedures.

Course Outcomes:

1.Design algorithms using fundamental concepts of computer system
2.Construct programs in C language Using different data types ,operators and standard library functions
3.Design applications involving the control flow statements.
4.Design a case study involving modular programming
5.Design application involving arrays and strings
6.Design applications using structures, unions, pointers and file system concepts.

LIST OF EXPERIMENTS:

Programming :

Exercise - 1 Basics

a) What is an OS Command, Familiarization of Editors - vi, Emacs

b) Using commands like mkdir, ls, cp, mv, cat, pwd, and man

c) C Program to Perform Adding, Subtraction, Multiplication and Division of two numbers From Command line

Exercise - 2 Basic Math

a) Write a C Program to Simulate 3 Laws at Motion

b) Write a C Program to convert Celsius to Fahrenheit and vice versa

Exercise - 3 Control Flow - I

a)Write a C Program to Find Whether the Given Year is a Leap Year or not.

b)Write a C Program to Add Digits & Multiplication of a number

Exercise – 4 Control Flow - II

a)Write a C Program to Find Whether the Given Number is

i) Prime Number

ii) Armstrong Number

b) Write a C program to print Floyd Triangle

c) Write a C Program to print Pascal Triangle

Exercise – 5 Functions

a) Write a C Program demonstrating of parameter passing in Functions and returning values.

b) Write a C Program illustrating Fibonacci, Factorial with Recursion without Recursion

Exercise – 6 Control Flow - III

a) Write a C Program to make a simple Calculator to Add, Subtract, Multiply or Divide Using switch…case

b) Write a C Program to convert decimal to binary and hex (using switch call function the function)

Exercise – 7 Functions – Continued Write a C Program to compute the values ofsin x and cos x and e^x values using Series expansion. (use factorial function)

Exercise – 8 Arrays:Demonstration of arrays

a) Search-Linear.

b) Sorting-Bubble, Selection.

c) Operations on Matrix.

Exercises - 9 Structures

a)Write a C Program to Store Information of a Movie Using Structure

b)Write a C Program to Store Information Using Structures with Dynamically Memory Allocation

c) Write a C Program to Add Two Complex Numbers by Passing Structure to a Function

Exercise - 10 Arrays and Pointers

a)Write a C Program to Access Elements of an Array Using Pointer

b) Write a C Program to find the sum of numbers with arrays and pointers.

Exercise – 11 Dynamic Memory Allocations

a) Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using malloc () function.

b) Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using calloc () function. Understand the difference between the above two programs

Exercise – 12 Strings:

a) Implementation of string manipulation operations **with** library function.

i) copy

ii) concatenate

iii) length

iv) compare

b) Implementation of string manipulation operations **without** library function.

i) copy

ii) concatenate

iii) length

iv) compare**Exercise -13** Files

a)Write a C programming code to open a file and to print it contents on screen.

b)Write a C program to copy files

Exercise - 14 Files Continued

a) Write a C program merges two files and stores their contents in another file.

b)Write a C program to delete a file.

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Program Name: MECH Faculty Name: Munira Begam

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	ENGLISH-II	R1612031	18/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
75 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

❖ To understand the basic fundamentals of Material science and Physical metallurgy. The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

Course Outcomes:

1.Interpret that technology should help solve the problems of common man.
2.Summarize that climate must be preserved.
3.Apply emerging technologies such as nanotechnology for the betterment of human life.
4.Outline that water is the elixir of life and try to conserve it.
5.Develop the attitude of devotion and dedication to hard work to succeed in life.
6.Solve personal problems and prioritize national problems.

1. .

SYLLABUS:

UNIT 1:

1. ' The Greatest Resource- Education' from English Encounters

UNIT 2:

1. 1. ' A Dilemma' from English Encounters

UNIT 3:

1. 1. 'Cultural Shock': Adjustments to new Cultural Environments from English Encounters.

UNIT 4:

1. 1. 'The Lottery' from English Encounters.

UNIT 5:

1. 1. ' The Health Threats of Climate Change' from English Encounters.

UNIT 6:

1. 1. ' The Chief Software Architect' from English Encounters

Program Name: MECH Faculty Name: SD.PARVEEN

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	MATHEAMTICS-II	R1612032	18/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
78 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

- ❖ To understand the basic fundamentals of Material science and Physical metallurgy. The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

Course Outcomes:

1.Solve algebraic or transcendental equation in a simple manner
2.Construct new data points within the range of a discrete set of known data points.
3.Solve differential equations by numerically.
4.Decompose any periodic function or periodic signal into the sum of a (possibly infinite) set of simple oscillating functions, namely sine's and cosines (or complex exponentials)
5.Decompose a function of time (a signal) into the frequencies that make it up
6.To solve the difference equations.

SYLLABUS:

UNIT I: Solution of Algebraic and Transcendental Equations:
Introduction- Bisection method – Method of false position – Iteration method – Newton-Raphson method (One
variable and simultaneous Equations).
UNIT II: Interpolation:
Introduction- Errors in polynomial interpolation – Finite differences- Forward differences- Backward differences
–Central differences – Symbolic relations and separation of symbols - Differences of a polynomial-Newton's
formulae for interpolation – Interpolation with unequal intervals - Lagrange's interpolation formula.
UNIT III: Numerical Integration and solution of Ordinary Differential equations:
Trapezoidal rule- Simpson's 1/3rd and 3/8th rule-Solution of ordinary differential equations by Taylor's series-
Picard's method of successive approximations-Euler's method - Runge-Kutta method (second and fourth order).
UNIT IV: Fourier Series:
Introduction- Periodic functions – Fourier series of -periodic function - Dirichlet's conditions – Even and odd
functions –Change of interval– Half-range sine and cosine series.
UNIT V: Applications of PDE:
Method of separation of Variables- Solution of One dimensional Wave, Heat and two-dimensional Laplace equation.
UNIT VI: Fourier Transforms:
Fourier integral theorem (without proof) – Fourier sine and cosine integrals - sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms.

Text Books:
1. B.S.Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.
2. N.P.Bali, Engineering Mathematics, Lakshmi Publications.
Reference Books:
1. Dean G. Duffy, Advanced engineering mathematics with MATLAB, CRC Press
2. V.Ravindranath and P.Vijayalakshmi, Mathematical Methods, Himalaya Publishing House.
3. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India
4. David Kincaid, Ward Cheney, Numerical Analysis-Mathematics of Scientific Computing, 3rd Edition, Universities Press.
5. Srimanta Pal, Subodh C.Bhunia, Engineering Mathematics, Oxford University Press.
6. Dass H.K., Rajnish Verma. Er., Higher Engineering Mathematics, S. Chand Co. Pvt. Ltd, Delhi.

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Program Name: MECH Faculty Name: SK.AREEF

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	MATHEAMTICS-III	R1612033	18/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
72 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

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PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

- ❖ To understand the basic fundamentals of Material science and Physical metallurgy. The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

Course Outcomes:

1.Acquire knowledge about rank, solve the system of linear equations and apply to electric

circuits
2.The properties of Eigen values and Eigen vectors & apply in free vibration of a two-mass system. Acquire knowledge about Cayley-Hamilton theorem & its applications, quadratic forms and reduction to normal forms
3.Evaluate double and triple integrals to find area, volume, mass and moment of inertia of plane and solid region. Acquire knowledge about application of integral to lengths, volumes and surface areas of revolution
4.Acquire knowledge about Gamma and Beta function and to evaluate improper integrals by using Beta & Gamma
5.Acquire knowledge of gradient, divergence, curl and the various applications of it
6.Acquire knowledge about line, surface & volume integrals and apply to find work done and understand the vector integral theorems by related problems.

SYLLABUS:

UNIT I: Linear systems of equations:
Rank-Echelon form-Normal form – Solution of linear systems – Gauss elimination - Gauss Jordon- Gauss Jacobi
and Gauss Seidal methods. Applications: Finding the current in electrical circuits.
UNIT II: Eigen values - Eigen vectors and Quadratic forms:
Eigen values - Eigen vectors– Properties – Cayley-Hamilton theorem - Inverse and powers of a matrix by using
Cayley-Hamilton theorem- Diagonalization- Quadratic forms- Reduction of quadratic form to canonical form –
Rank - Positive, negative and semi definite - Index – Signature.
Applications: Free vibration of a two-mass system.
UNIT III: Multiple integrals:
Curve tracing: Cartesian, Polar and Parametric forms.
Multiple integrals: Double and triple integrals – Change of variables – Change of order of integration.
Applications: Finding Areas and Volumes.
UNIT IV: Special functions:
Beta and Gamma functions- Properties - Relation between Beta and Gamma functions- Evaluation of improper
integrals.
Applications: Evaluation of integrals.**UNIT V: Vector Differentiation:**

Gradient- Divergence- Curl - Laplacian and second order operators -Vector identities.
Applications: Equation of continuity, potential surfaces
UNIT VI: Vector Integration:
Line integral – Work done – Potential function – Area- Surface and volume integrals Vector integral theorems:
Greens, Stokes and Gauss Divergence theorems (without proof) and related problems.
Applications: Work done, Force.

Text Books:

1. **B.S.Grewal,** Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.
2. **N.P.Bali**, Engineering Mathematics, Lakshmi Publications.

Reference Books:

1. **Greenberg,** Advanced Engineering Mathematics, 2nd edition, Pearson edn
2. **Erwin Kreyszig,** Advanced Engineering Mathematics, 10th Edition, Wiley-India
3. **Peter O'Neil,** Advanced Engineering Mathematics,7th edition, Cengage Learning.
4. **D.W. Jordan and T.Smith,** Mathematical Techniques, Oxford University Press.
5. **Srimanta Pal, Subodh C.Bhunia**, Engineering Mathematics, Oxford University Press.
6. **Dass H.K., Rajnish Verma. Er.,** Higher Engineering Mathematics, S. Chand Co. Pvt. Ltd, Delhi

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Program Name: MECH Faculty Name: A.BINDU MADHAVI

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	ENGINNERING PHYSICS	R1612034	18/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
75 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

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PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

- ❖ To understand the basic fundamentals of Material science and Physical metallurgy. The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

Course Outcomes:

1.Classify and explain the concepts of principles of superposition, Interference, Diffraction and polarization
2.Explain the concepts of production of lasers, wave propagation in optical fibers, structures of crystals and XRD technique
3.Analyze properties of Magnetic, Dielectric, Super conductivity and applications of the devices in different fields in engineering
4.List out the Absorption coefficients of materials and explain the Fundamental laws of electromagnetism and Maxwell's Electromagnetic
5.Explain the properties and theories of matter waves in Quantum levels and Classify the materials into conductors, semi – conductors & insulators
6.Explain the properties of semiconductors and Mechanisms of LEDs, Photo conductors and solar cells by minimizing the environmental pollution.

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SYLLABUS:

UNIT-I

INTERFERENCE: Principle of Superposition – Coherent Sources – Interference in thin films (reflection geometry) – Newton's rings – construction and basic principle of Interferometers.

UNIT-II

DIFFRACTION: Fraunhofer diffraction at single slit cases of double slit, N-slits & Circular Aperture (Qualitative treatment only)-Grating equation - Resolving power of a grating, Telescope and Microscopes.

UNIT-III

POLARIZATION: Types of Polarization-production - Nicol Prism -Quarter wave plate and Half Wave plate –
Working principle of Polarimeter (Sacharimeter)

LASERS: Characteristics– Stimulated emission – Einstein's Transition Probabilities- Pumping schemes - Ruby
laser – Helium Neon laser.

UNIT-IV

ACOUSTICS: Reverberation time - Sabine's formula – Acoustics of concert-hall.

ULTRASONICS: Production - Ultrasonic transducers- Non-Destructive Testing –Applications.

UNIT-V

CRYSTALLOGRAPHY & X-RAY DIFFRACTION: Basis and lattice – Bravais systems- Symmetry elements- Unit cell- packing fraction – coordination number- Miller indices – Separation between successive (h
k l) planes – Bragg's law.

NUCLEAR ENERGY – SOURCE OF POWER: Mass defect & Binding Energy – Fusion and Fission as sources – Fast breeder Reactors.

UNIT-VI

MAGNETISM: Classification based on Field, Temperature and order/disorder –atomic origin – Ferromagnetism- Hysteresis- applications of magnetic materials (Para &Ferro)..

DIELECTRICS: Electric Polarization – Dielectrics in DC and AC fields – Internal field – Clausius Mossoti Equation - Loss, Breakdown and strength of dielectric materials – Ferroelectric Hysteresis and applications.

Text Books:

1. A Text book of Engineering Physics – by Dr. M.N.Avadhanulu and Dr.P.G.Kshirasagar, S.Chand & Company
Ltd., (2014)
2. Physics for Engineers by M.R.Srinasan, New Age international publishers (2009)
3. Engineering Physics by D.K.Bhattacharya and Poonam Tandon , Oxford press (2015)

Reference books:

1. Applied Physics by P.K.Palanisamy , Scitech publications (2014)
2. Lasers and Non-Linear optics by B.B.Laud , Newage international publishers (2008)

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Program Name: MECH Faculty Name: K.LAKSHMI GANESH

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	BASIC ELECTRONICS AND ELECTRICAL ENGINEERING	R1612035	18/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
68 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

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PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

- To understand the basic fundamentals of Material science and Physical metallurgy. The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

Course Outcomes:

1.Remembre the basic principles of electrical circuital law's and analyze of networks.
2.Understand the principle of operation and construction details of DC machines and Transformers
3.Understand the principle of operation and construction details of Transformers and O.C and S.C Test on Transformer
4.Understand the principle of operation and construction details of Alternator, Three-Phase Induction motors and three-phase synchronous motors
5.Analyze the operation of PN junction diode, half wave, full wave rectifiers and OP-AMPs.
6.Classify the operation of PNP and NPN Transistors and various amplifiers.

SYLLABUS:

UNIT - I
Electrical Circuits:
Basic definitions - Types of network elements - Ohm's Law - Kirchhoff's Laws - Inductive networks - Capacitive networks – Series - Parallel circuits - Star-delta and delta-star transformations.
UNIT - II
Dc Machines:
Principle of operation of DC generator – EMF equation - Types of DC machine – Torque equation – Applications
– Three point starter - Speed control methods of DC motor – Swinburne's Test.
UNIT - III
Transformers:
Principle of operation and construction of single phase transformers – EMF equation – Losses – OC & SC tests -
Efficiency and regulation.
UNIT - IV
AC Rotating Machines:
Principle of operation and construction of alternators– Types of alternators – Principle of operation of synchronous motor - Principle of operation of 3-Phase induction motor – Slip-torque characteristics - Efficiency –
Applications.

UNIT V
Rectifiers & Linear ICs:
PN junction diodes - Diode applications(Half wave and bridge rectifiers). Characteristics of operation amplifiers
(OP-AMP) - application of OP-AMPs (inverting, non-inverting, integrator and differentiator).
UNIT VI
Transistors:

PNP and NPN junction transistor, transistor as an amplifier- Transistor amplifier - Frequency response of CE
amplifier - Concepts of feedback amplifier.

Learning Outcomes:

- Able to analyse the various electrical networks.
- Able to understand the operation of DC generators,3-point starter and DC machine testing by Swinburne’s Test.
- Able to analyse the performance of single-phase transformer.
- Able to explain the operation of 3-phase alternator and 3-phase induction motors.
- Able to analyse the operation of half wave, full wave bridge rectifiers and OP-AMPs.
- Able to explain the single stage CE amplifier and concept of feedback amplifier.

Text Books:

1. Electrical Technology by Surinder Pal Bali, Pearson Publications.
2. Electronic Devices and Circuits, R.L. Boylestad and Louis Nashelsky, 9th edition, PEI/PHI 2006.

Reference Books:

1.Electrical Circuit Theory and Technology by John Bird, Routledge Taylor &Francis Group
2. Basic Electrical Engineering by M.S.Naidu and S.Kamakshiah,TMH Publications
3.Fundamentals of Electrical Engineering by Rajendra Prasad, PHI Publications,2nd edition
4.Basic Electrical Engineering by Nagsarkar,Sukhija, Oxford Publications,2nd edition
5.Industrial Electronics by G.K. Mittal, PHI

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Program Name: MECH Faculty Name: Dr.P.S.SRINIVAS

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	ENGINNERING DRAWING	R1612036	18/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
68 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

❖ To understand the basic fundamentals of Material science and Physical metallurgy. The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

Course Outcomes:

1.Remembre the basic principles of electrical circuital law's and analyze of networks.
2.Understand the principle of operation and construction details of DC machines and Transformers
3.Understand the principle of operation and construction details of Transformers and O.C and S.C Test on Transformer
4.Understand the principle of operation and construction details of Alternator, Three-Phase Induction motors and three-phase synchronous motors
5.Analyze the operation of PN junction diode, half wave, full wave rectifiers and OP-AMPs.
6.Classify the operation of PNP and NPN Transistors and various amplifiers.

SYLLABUS:

UNIT – I

Polygons: Constructing regular polygons by general methods, inscribing and describing polygons on circles. **Curves:** Parabola, Ellipse and Hyperbola by general methods, cycloids, involutes, tangents & normals for the curves.

UNIT – II

Scales: Plain scales, diagonal scales and vernier scales
Orthographic Projections: Horizontal plane, vertical plane, profile plane, importance of reference lines, projections of points in various quadrants, projections of lines, lines parallel either to of the reference planes (HP,VP or PP)

UNIT – III

Projections of straight lines inclined to both the planes, determination of true lengths, angle of inclination and traces- HT, VT

UNIT – IV

Projections of planes: regular planes perpendicular/parallel to one plane and inclined to the other reference plane; inclined to both the reference planes.

UNIT – V

Projections of Solids – Prisms, Pyramids, Cones and Cylinders with the axis inclined to one of the planes.

UNIT – VI

Conversion of isometric views to orthographic views; Conversion of orthographic views to isometric views.

TEXT BOOKS:
1. Engineering Drawing by N.D. Butt, Chariot Publications
2. Engineering Drawing by Agarwal & Agarwal, Tata McGraw Hill Publishers

REFERENCE BOOKS:
1. Engineering Drawing by K.L.Narayana & P. Kannaiah, Scitech Publishers
2. Engineering Graphics for Degree by K.C. John, PHI Publishers
3. Engineering Graphics by PI Varghese, McGrawHill Publishers
4. Engineering Drawing + AutoCad – K Venugopal, V. Prabhu Raja, New Age

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Program Name: ME-A&B Faculty Name: MUNIRA BEGUM/T.SANTHI SREE

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	ENGLISH COMMUNICATION SKILLS LAB-II	R1612037	18/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
36 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Specify, architect, design and analyze systems that efficiently generate, transmit, distribute and utilize electrical power.

PSO2. Analyze and design modern electrical drive systems and modern lighting systems.

PSO3. Understand the principles and construction of electrical machines and determine their performance through testing.PSO4. Specify, design, implement and test analog and embedded signal processing electronic systems using the state of the art components and software tools.

Course Objectives:

Course Objective: To impart practical exposure on the microstructures of various materials and their hardness evaluation. Also to impart practical knowledge on the evaluation of material properties through various destructive testing procedures.

Course Outcomes:

1.Infer different components of non-verbal communication.
2.Develop communication skills including soft skills.
3.Infer how to participate in GDs and interviews.
Improve Presentation skills.

SYLLABUS:

UNIT 1:

1. Debating

Practice work

UNIT 2:

1. Group Discussions

Practice work

UNIT 3:

1. Presentation Skills

Practice work

UNIT 4:

1. Interview Skills

Practice work

UNIT 5:

1. Email,
2. Curriculum Vitae

Practice work

UNIT 6:

1. Idiomatic Expressions
2. Common Errors in English

Practice work

Reference Books:

1. Strengthen your communication skills by Dr M Hari Prasad, Dr Salivendra Raju and Dr G Suvarna Lakshmi, Maruti Publications.
2. English for Professionals by Prof Eliah, B.S Publications, Hyderabad.
3. Unlock, Listening and speaking skills 2, Cambridge University Press

4. Spring Board to Success, Orient BlackSwan

5. A Practical Course in effective english speaking skills, PHI

6. Word power made handy, Dr shalini verma, Schand Company

7. Let us hear them speak, Jayashree Mohanraj, Sage texts

8. Professional Communication, Aruna Koneru, Mc Grawhill Education

9. Cornerstone, Developing soft skills, Pearson Education

Program Name: ME-A&B

Faculty Name: A.BINDU MADHAVI / T.LAKSHMI DEVI / N.V.MALAVIKA

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	ENGINEERING PHYSICS LAB	R1612038	18/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
36 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

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PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Specify, architect, design and analyze systems that efficiently generate, transmit, distribute and utilize electrical power.

PSO2. Analyze and design modern electrical drive systems and modern lighting systems.

PSO3. Understand the principles and construction of electrical machines and determine their performance through testing.

PSO4. Specify, design, implement and test analog and embedded signal processing electronic systems using the state of the art components and software tools.

Course Objectives:

Course Objective: To impart practical exposure on the microstructures of various materials and their hardness evaluation. Also to impart practical knowledge on the evaluation of material properties through various destructive testing procedures.

Course Outcomes:

1.Illustrate the concepts of principles of superposition, Interference and Diffraction.
2.Explain the concepts of finding acceleration due to gravity, radius of gyration and rigidity modulus, velocity of sound in air.
3.Compare the characteristics of electronic devices P-N semiconductor diode & Zener diode and applications of the devices in different fields in engineering.
4.Find the experimental values and compare with their standard values.
5.Extend the results to recent developments.
6.Examine the basics of physics in engineering field.

LIST OF EXPERIMENTS:

1. Determination of wavelength of a source-Diffraction Grating-Normal incidence.
2. Newton's rings – Radius of Curvature of Plano - Convex Lens.
3. Determination of thickness of a spacer using wedge film and parallel interference fringes.
4. Determination of Rigidity modulus of a material- Torsional Pendulum.
5. Determination of Acceleration due to Gravity and Radius of Gyration- Compound Pendulum.
6. Melde's experiment – Transverse and Longitudinal modes.
7. Verification of laws of vibrations in stretched strings – Sonometer.
8. Determination of velocity of sound – Volume Resonator.
9. L- C- R Series Resonance Circuit.
10. Study of I/V Characteristics of Semiconductor diode.
11. I/V characteristics of Zener diode.
12. Characteristics of Thermistor – Temperature Coefficients.
13. Magnetic field along the axis of a current carrying coil – Stewart and Gee's apparatus.
14. Energy Band gap of a Semiconductor p - n junction.
15. Hall Effect in semiconductors.
16. Time constant of CR circuit.
17. Determination of wavelength of laser source using diffraction grating.
18. Determination of Young's modulus by method of single cantilever oscillations.
19. Determination of lattice constant – lattice dimensions kit.
20. Determination of Planck's constant using photocell.
21. Determination of surface tension of liquid by capillary rise method.

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Program Name: ME-A&B Faculty Name: B.RAJESH

Class	Semester	Title of The Paper	Paper Code	W.E.F
I	I	EWS/ITWORK SHOP	R1612039	18/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
36 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

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PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Specify, architect, design and analyze systems that efficiently generate, transmit, distribute and utilize electrical power.

PSO2. Analyze and design modern electrical drive systems and modern lighting systems.

PSO3. Understand the principles and construction of electrical machines and determine their performance through testing.

PSO4. Specify, design, implement and test analog and embedded signal processing electronic systems using the state of the art components and software tools.

Course Objectives:

Course Objective: To impart practical exposure on the microstructures of various materials and their hardness evaluation. Also to impart practical knowledge on the evaluation of material properties through various destructive testing procedures.

Course Outcomes:

1.Prepare the simple jobs as per specification using carpentry tools.
2.Prepare the simple jobs as per specification using fitting tools.
Prepare the simple jobs as per specification using tin smithy tools.
3.Make simple connections as per specifications given.
4.Infer different types of hardware devices, operating systems and software tools through practical exposure.
5.Illustrate various tables using word and excel and develop different types of charts by analyzing the data given in the tables.

LIST OF EXPERIMENTS:

ENGINEERING WORKSHOP

Trade:

Carpentry 1. T-Lap Joint

2. Cross Lap Joint

3. Dovetail Joint

4. Mortise and Tenon Joint

Fitting 1. Vee Fit

2. Square Fit

3. Half Round Fit

4. Dovetail Fit

Black Smithy 1. Round rod to Square

2. S-Hook

3. Round Rod to Flat Ring

4. Round Rod to Square headed bolt

House Wiring 1. Parallel / Series Connection of three bulbs

2. Stair Case wiring

3. Florescent Lamp Fitting

4. Measurement of Earth Resistance

Tin Smithy 1. Taper Tray

2. Square Box without lid

3. Open Scoop

4. Funnel

IT WORKSHOP

1. System Assembling, Disassembling and identification of Parts / Peripherals

2. **Operating System Installation**-Install Operating Systems like Windows, Linux along with necessary Device

Drivers.

3. MS-Office / Open Office

a. **Word** - Formatting, Page Borders, Reviewing, Equations, symbols.

b. **Spread Sheet** - organize data, usage of formula, graphs, charts.

c. **Power point** - features of power point, guidelines for preparing an effective
presentation.

d. **Access**- creation of database, validate data.

I Year - II Semester

L T P C

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ENGINEERING WORKSHOP & IT WORKSHOP

4. **Network Configuration & Software Installation**-Configuring TCP/IP, proxy and firewall settings. Installing
application software, system software & tools.

5. **Internet and World Wide Web**-Search Engines, Types of search engines, netiquette, cyber hygiene.

6. Trouble Shooting-Hardware trouble shooting, Software trouble shooting.

7. **MATLAB-** basic commands, subroutines, graph plotting.

8. **LATEX**-basic formatting, handling equations and images.

TEXT BOOKS:

1. Computer Hardware, Installation, Interfacing, Troubleshooting and Maintenance, K.L. James, Eastern Economy Edition.

2. Microsoft Office 2007: Introductory Concepts and Techniques, Windows XP Edition ByGary B. Shelly, Misty E. Vermaat and Thomas J. Cashman (2007, Paperback).

3. LATEX- User’s Guide and Reference manual, Leslie Lamport, Pearson, LPE, 2/e.

4. Getting Started with MATLAB: A Quick Introduction for Scientists and ngineers, Rudraprathap, Oxford University Press, 2002.

5. Scott Mueller’s Upgrading and Repairing PCs, 18/e, Scott. Mueller, QUE, Pearson, 2008

6. The Complete Computer upgrade and repair book, 3/e, Cheryl A Schmidt, Dreamtech.

7. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech.

8. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.

Program Name: MECH Faculty Name: C.SRILATHA

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	I	Material Science and Metallurgy	R1621031	18/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
65 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

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PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

- To understand the basic fundamentals of Material science and Physical metallurgy. The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

Course Outcomes:

1.Understand the basic concepts of bonds in metals and alloys, basic requirements for the formation of solid solutions and other compounds.
2.Understand the regions of stability of the phases that can occur in an alloy system in order to solve the problems in practical metallurgy.
3.Distinguish different types of cast irons, steels their properties and practical applications.
4.Understand the affect of various alloying elements on iron-iron carbide system, various heat treatment and strengthening processes used in practical applications.
5.Understand the properties and applications of widely used non-ferrous metals and alloys.
6.Understand the properties and applications of ceramic, composite and other advanced materials.

UNIT – I

Structure of Metals and Constitution of alloys: Bonds in Solids – Metallic bond - crystallization of metals, grain and grain boundaries, effect of grain boundaries on the properties of metal / alloys – determination of grain size. Necessity of alloying, types of solid solutions, Hume Rotherys rules, intermediate alloy phases, and electron compounds.

UNIT –II

Equilibrium Diagrams : Experimental methods of construction of equilibrium diagrams, Isomorphous alloy systems, equilibrium cooling and heating of alloys, Lever rule, coring miscibility gaps, eutectic systems, congruent melting intermediate phases, peritectic reaction. Transformations in the solid state – allotropy, eutectoid, peritectoid reactions, phase rule, relationship between equilibrium diagrams and properties of alloys. Study of important binary phase diagrams of Cu-Ni-, Al-Cu, Bi-Cd and Fe-Fe_3C.

UNIT –III

Cast Irons and Steels: Structure and properties of White Cast iron, Malleable Cast iron, grey cast iron, Spheroidal graphite cast iron, Alloy cast irons. Classification of steels, structure and properties of plain carbon steels, Low alloy steels, Hadfield manganese steels, tool and die steels.

UNIT – IV

Heat treatment of Alloys: Effect of alloying elements on Fe-Fe_3C system, Annealing, normalizing, hardening, TTT diagrams, tempering , hardenability, surface - hardening methods, Age hardening treatment, Cryogenic treatment of alloys.

UNIT – V

Non-ferrous Metals and Alloys: Structure and properties of Copper and its alloys, Aluminium and its alloys, Titanium and its alloys.

UNIT – VI

Ceramic and composite materials: Crystalline ceramics, glasses, cermets, abrasive materials, nanomaterials – definition, properties and applications of the above. Classification of composites, various methods of component manufacture of composites, particle – reinforced materials, fiber reinforced materials, metal ceramic mixtures, metal – matrix composites and C – C composites.

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Program Name: MECHANICAL Faculty Name: G.RAVALI

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	I	THERMODYNAMICS	R16210303	11/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
80 Hours	Theory 6	Practical	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
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9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.
2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs
3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

1. The student should be able to understand the basic concepts like thermodynamic system, its boundary and related fundamental definitions. Distinction between point function and path function shall be made with respect to energy, work and Heat.

2. To learn the first law of thermodynamics, which is also the energy conservation principle, and should be able to apply to different thermodynamic systems. To understand the concept of equality of temperature and the principle of operation of various temperature measuring devices.

3. To understand the second law statements and the associated terms and should be able to apply the principles to heat engines. Able to analyse the concepts of Carnot cycle, entropy, availability and irreversibility.

4. To understand the process of steam formation and its representation on property diagrams with various phase changes and should be able to calculate the quality of steam after its expansion in a steam turbine, with the help of standard steam tables and charts..

5. To make students to use Psychrometric chart and calculate various psychrometric properties of air.

6. To understand the concept of air standard cycles and should be able to calculate the efficiency and performance parameters of the systems that use these cycles.

Course Outcomes:

1. Understand the basics of thermodynamics.
2. Understand the concept of thermometry and learn energy conversions during various processes.
3. Understand the second law of thermodynamics and working of heat engine, heat pump.
4. Understand phase change process and working of steam turbines.
5. Understand psychrometric properties.
6. Understand the working of air standard cycles and refrigeration cycles.

SYLLABUS:

UNIT – I

Introduction: Basic Concepts : System, boundary, Surrounding, control volume, Universe, Types of Systems,Macroscopic and Microscopic viewpoints, Concept of Continuum, Thermodynamic Equilibrium, State, Property,Process, Cycle – Reversibility – Quasi – static Process, Irreversible Process, Causes of Irreversibility – Energy inState and in Transition, Types, Work and Heat, Point and Path function. Zeroth Law of Thermodynamics –Concept of Temperature – Principles of Thermometry –Reference Points – Const. Volume gas Thermometer

Scales of Temperature, Ideal Gas Scale – PMM I.

UNIT – II

Joule's Experiments – First law of Thermodynamics – Corollaries – First law applied to a Process – applied to a flow system – Steady Flow Energy Equation. PMM-I, throttling and free expansion processes – deviations fromperfect gas model – Vander waals equation of state – compressibility charts – variable specific heats – gas tables

UNIT – III

Limitations of the First Law – Thermal Reservoir, Heat Engine, Heat pump, Parameters of performance, Second Law of Thermodynamics, Kelvin-Planck and Clausius Statements and their Equivalence / Corollaries, PMM of Second kind, Carnot's principle, Carnot cycle and its specialties, Thermodynamic scale of Temperature, Clausius Inequality, Entropy, Principle of Entropy Increase – Energy Equation, Availability and Irreversibility –Thermodynamic Potentials, Gibbs and Helmholtz Functions, Maxwell Relations – Elementary Treatment of the

Third Law of Thermodynamics.

UNIT – IV

Pure Substances, P-V-T- surfaces, T-S and h-s diagrams, Mollier Charts, Phase transformations – Triple point at critical state properties during change of phase, Dryness Fraction – Clausius – Clapeyron Equation Property tables. Mollier charts – Various Thermodynamic processes and energy Transfer – Steam Calorimetry.

UNIT – V

Mixtures of perfect Gases – Mole Fraction, Mass friction Gravimetric and volumetric Analysis – Dalton's Law of partial pressure, Avogadro's Laws of additive volumes – Mole fraction , Volume fraction and partial pressure,Equivalent Gas const. And Molecular Internal Energy, Enthalpy, sp. Heats and Entropy of Mixture of perfect Gases and Vapour, Atmospheric air - Psychrometric Properties – Dry bulb Temperature, Wet Bulb Temperature,Dew point Temperature, Thermodynamic Wet Bulb Temperature, Specific Humidity, Relative Humidity,

saturated Air, Vapour pressure, Degree of saturation – Adiabatic Saturation , Carrier's Equation – Psychrometric

chart.

UNIT VI

. **Power Cycles :** Otto, Diesel, Dual Combustion cycles, Sterling Cycle, Atkinson Cycle, Ericcson Cycle, Lenoir Cycle – Description and representation on P–V and T-S diagram, Thermal Efficiency, Mean Effective Pressures on Air standard basis – comparison of Cycles.

Refrigeration Cycles : Brayton and Rankine cycles – Performance Evaluation – combined cycles, Bell-Colemancycle, Vapour compression cycle-performance Evaluation

Program Name: B.Tech Faculty Name: T.Mutyala Raju

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	I	Fluid Mechanics &Hydraulic Machinery		6

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.

2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

1. Study Physical properties of fluids, Pascal's law, Hydrostatic law & different Pressure measuring devices.
2. Learn classification of Fluid flow, Hydrostatic forces on submerged plane surfaces, Continuity equation and flow net analysis.

3. Familiarize the concept of Navier -Stokes, Bernoulli's, Euler's and Impulse momentum equations on a Pipes & Pipe bend.
4. Study the Characteristics of Boundary layer along a thin flat plate, Derive Vonkarmen momentum integral equation, concept of drag & lift.
5. Learn laws of fluid friction, Reynold's experiment, major loss by Darcy's equation & minor losses in pipe flow. TEL & HGL, Moody's Chart & to design pipe networks.
6. Determine the Velocity by Pitot tube & Discharge of flow through Channels & pipes by & Notches, Weirs &Venturimeter, Orifice meter.
7. Learn Hydrodynamic force of jets on different shaped stationary and moving vanes, velocity triangles at inlet and outlet, work done and efficiency-Angular momentum principle, Applications to radial flow turbines.
8. Study about working, workdone, efficiency & velocity triangles of Pelton wheel, Francis & Kaplan turbine & Draft tube theory.
9. Learn about centrifugal & reciprocating pumps working, workdone, efficiency, specific speed, characteristic curves & cavitation.

Course Outcomes:

1. Know the concept of fluid and its properties, manometry, hydrostatic forces acting on different surfaces and also problem solving techniques.
2. Exposed to the basic laws of fluids, flow patterns, viscous flow through ducts and their corresponding problems.
3. Aware of the concepts related to boundary layer theory, flow separation, basic concepts of velocity profiles, dimensionless numbers and dimensional analysis.
4. Know the hydrodynamic forces acting on vanes and their performance evaluation.
5. Aware of the importance, function and performance of hydro machinery.
6. Evaluate the performance characteristics of hydraulic turbines. Also a little knowledge on hydraulic systems and fluidics is imparted to the student.

Syllabus:

UNIT I

Fluid statics: Dimensions and units: physical properties of fluids- specific gravity, viscosity and its significance, surface tension, capillarity, vapor pressure. Atmospheric gauge and vacuum pressure – measurement of pressure. Manometers- Piezometer, U-tube, inverted and differential manometers. Pascal's law, hydrostatic law. Buoyancy and floatation: Meta center, stability of floating body. Submerged bodies. Calculation of metacenter height. Stability analysis and applications.

UNIT-II

Fluid kinematics: Introduction, flow types. Equation of continuity for one dimensional flow, circulation and vorticity, Stream line, path line and streak lines and stream tube. Stream function and velocity potential function, differences and relation between them. Condition for irrotational flow, flow net, source and sink, doublet and vortex flow. Fluid dynamics: surface and body forces –Euler's and Bernoulli's equations for flow along a stream line, momentum equation and its applications, force on pipe bend. Closed conduit flow: Reynold's experiment- Darcy Weisbach equation- Minor losses in pipes- pipes in series and pipes in parallel- total energy line-hydraulic gradient line.

UNIT-III

Boundary Layer Theory: Introduction, momentum integral equation, displacement, momentum and energy thickness, separation of boundary layer, control of flow separation, Stream lined body, Bluff body and its applications, basic concepts of velocity profiles.

Dimensional Analysis: Similitude and modelling – Dimensionless numbers.

UNIT-IV

Basics of turbo machinery: hydrodynamic force of jets on stationary and moving flat, inclined, and curved vanes, jet striking centrally and at tip, velocity diagrams, work done and efficiency, flow over radial vanes.

UNIT-V

Centrifugal pumps: classification, working, work done – manometric head- losses and efficiencies- specific speed- pumps in series and parallel-performance characteristic curves, cavitation & NPSH. Reciprocating pumps: Working, Discharge, slip, indicator diagrams.

UNIT-VI

Hydraulic Turbines: classification of turbines, impulse and reaction turbines, Pelton wheel, Francis turbine and Kaplan turbine-working proportions, work done, efficiencies, hydraulic design –draft tube-theory- functions and efficiency. Performance of hydraulic turbines: Geometric similarity, Unit and specific quantities, characteristic curves, governing of turbines, selection of type of turbine, cavitation, surge tank, water hammer. Hydraulic systems- hydraulic ram, hydraulic lift, hydraulic coupling. Fluidics – amplifiers, sensors and oscillators. Advantages, limitations and applications.

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: MECHANICAL Faculty Name: P.VINAY

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	I	MECHANICS OF SOLIDS	R1621032	11/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
86 Hours	Theory 6	Practical	3	Internal 30	External 70	3

Programme Outcomes:

13. **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
14. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
15. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
16. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
17. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

18. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
19. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
20. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
21. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
22. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
23. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
24. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.
2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs
3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

7. After studying this unit student will know the basic terms like stress, strain poissons ratio…etc and stresses in bars of varying cross sections, composite bars, thermal stress in members, stresses on inclined planes with analytical approach and graphical approach, strain energy under different loadings and also problem solving techniques.

8. After studying this unit student will know the construction of shear force diagrams and bending moment diagrams to the different loads for the different support arrangements and also problem solving techniques.

9. After studying this unit student will know the bending and shear stress induced in the beams which are made with different cross sections like rectangular, circular, triangular, I, T angle sections and also problem solving techniques.

10. After studying this unit student will know how to finding slope and deflection for different support arrangements by Double integration method, Macaulay's method and Moment-Area and also problem solving techniques.

11. After studying this unit student will know how a cylinder fails, what kind of stresses induced in cylinders subjected to internal, external pressures and also problem solving techniques.

12. After studying this unit student will know shear stresses induced in circular shafts, discussing columns in stability point of view and columns with different end conditions.

Course Outcomes:

1.Determine Stress, Strain & Strain Energy in Uniform, Varying cross section and Composite Bars & Appraise Principal stresses & Strains analytically, Graphically ..

2.Sketch Shear Force & Bending Moment diagrams, for different beams subjected to various types of loading.

3.Derive the equation of bending, Determination of bending stresses in beams of various cross sections for different loading conditions ; Design of simple beams & Determine Shear stresses in beams for different cross sections and its distribution.

4.Determine slope & deflection in beams of different cross sections and end conditions for various types of loading using different methods.

5.Estimate stresses and strains in Thin & Thick Cylinders and Spherical shells.

6.Evaluate Torque & Power of circular shafts by using Torsional equation & Examine the Crippling & Safe loads using Euler's & Rankine's theories for the columns with different end conditions.

SYLLABUS:

UNIT – I

SIMPLE STRESSES & STRAINS : Elasticity and plasticity – Types of stresses & strains–Hooke's law – stress– strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio & volumetric strain – Bars of varying section – composite bars – Temperature stresses- Complex Stresses - Stresses on an inclined plane under different uniaxial and biaxial stress conditions - Principal planes and principal stresses - Mohr's circle - Relation between elastic constants, Strain energy – Resilience – Gradual, sudden, impact and shock loadings.

UNIT – II

SHEAR FORCE AND BENDING MOMENT : Definition of beam – Types of beams – Concept of shear force
and bending moment – S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected
to point loads, u.d.l, uniformly varying loads and combination of these loads – Point of contra flexure – Relation
between S.F., B.M and rate of loading at a section of a beam.

UNIT – III

FLEXURAL STRESSES : Theory of simple bending – Assumptions – Derivation of bending equation: M/ I =f/y = E/R Neutral axis – Determination bending stresses – section modulus of rectangular and circular sections (Solid and Hollow), I,T, Angle and Channel sections – Design of simple beam sections.

SHEAR STRESSES: Derivation of formula – Shear stress distribution across various beams sections like rectangular, circular, triangular, I, T angle sections.

UNIT – IV

DEFLECTION OF BEAMS : Bending into a circular arc – slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, - U.D.L uniformly varying load. Mohr's theorems – Moment area method – application to simple cases including overhanging beams, Statically Indeterminate Beams and solution methods.

UNIT – V

THIN CYLINDERS: Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in dia, and volume of thin cylinders – Riveted boiler shells – Thin spherical shells.

THICK CYLINDERS: –lame's equation – cylinders subjected to inside & outside pressures –compound cylinders.

UNIT VI

TORSION: Introduction-Derivation- Torsion of Circular shafts- Pure Shear-Transmission of power by circular
shafts, Shafts in series, Shafts in parallel.

COLUMNS:

Buckling and Stability, Columns with Pinned ends, Columns with other support Conditions, Limitations of Euler's Formula, Rankine's Formula.

Program Name: MECHANICAL-A&B Faculty Name: **U. Ravi Kiran**

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	I	**MANAGERIAL ECONOMICS &FINANCIAL ANALYSIS**	**RT21034**	19/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
73 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

PSO2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

PSO3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

The Learning objectives of this paper is to understand the concept and nature of Managerial Economics and its relationship with other disciplines and also to understand the Concept of Demand and Demand forecasting,

Production function, Input Output relationship, Cost-Output relationship and Cost-Volume-Profit Analysis.

 To understand the nature of markets, Methods of Pricing in the different market structures and to know the different forms of Business organization and the concept of Business Cycles.

 To learn different Accounting Systems, preparation of Financial Statement and uses of different tools for performance evaluation. Finally, it is also to understand the concept of Capital, Capital Budgeting and the techniques used to evaluate Capital Budgeting proposals.

Course Outcomes:

CO1: Understand the Law of Demand

CO2: Understand the concept of Break-Even Analysis.

CO3 Understand the different types of market situations.

CO4: Understand different types of Business Organizations.

CO5: Understand financial statements and analyse them.

CO6: Understand Capital Budgeting Process.

UNIT-I

Introduction to Managerial Economics and demand Analysis:

Definition of Managerial Economics –Scope of Managerial Economics and its relationship with other subjects –

Concept of Demand, Types of Demand, Determinants of Demand- Demand schedule, Demand curve, Law of

Demand and its limitations- Elasticity of Demand, Types of Elasticity of Demand and Measurement-Demand

forecasting and Methods of forecasting, Concept of Supply and Law of Supply.

UNIT – II:

Production and Cost Analysis:

Concept of Production function- Cobb-Douglas Production function- Leontief production function - Law of Variable proportions-Isoquants and Isocosts and choice of least cost factor combination-Concepts of Returns to

scale and Economies of scale-Different cost concepts: opportunity costs, explicit and implicit costs- Fixed costs, Variable Costs and Total costs –Cost –Volume-Profit analysis-Determination of Breakeven point(simple problems)-Managerial significance and limitations of Breakeven point.

UNIT – III:

Introduction to Markets, Theories of the Firm & Pricing Policies:

Market Structures: Perfect Competition, Monopoly, Monopolistic competition and Oligopoly – Features – Price
and Output Determination – Managerial Theories of firm: Marris and Williamson's models – other Methods of
Pricing: Average cost pricing, Limit Pricing, Market Skimming Pricing, Internet Pricing: (Flat Rate Pricing, Usage sensitive pricing) and Priority Pricing.

UNIT – IV:

Types of Business Organization and Business Cycles:

Features and Evaluation of Sole Trader, Partnership, Joint Stock Company – State/Public Enterprises and their
forms – Business Cycles : Meaning and Features – Phases of a Business Cycle.

UNIT – V:

Introduction to Accounting & Financing Analysis:

Introduction to Double Entry Systems – Preparation of Financial Statements-Analysis and Interpretation of

Financial Statements-Ratio Analysis – Preparation of Funds flow and cash flow statements (Simple Problems)

UNIT – VI:

Capital and Capital Budgeting: Capital Budgeting: Meaning of Capital-Capitalization-Meaning of Capital Budgeting-Time value of money- Methods of appraising Project profitability: Traditional Methods(pay back period, accounting rate of return) and modern methods(Discounted cash flow method, Net Present Value method,
Internal Rate of Return Method and Profitability Index)

TEXT BOOKS

1. Dr. N. AppaRao, Dr. P. Vijay Kumar: 'Managerial Economics and Financial Analysis', Cengage Publications,
New Delhi – 2011

2. Dr. A. R. Aryasri – Managerial Economics and Financial Analysis, TMH 2011

3. Prof. J.V.Prabhakararao, Prof. P. Venkatarao. 'Managerial Economics and Financial Analysis', Ravindra Publication.

Program Name: MECHANICAL-A&B Faculty Name: **T.V.S. Harsha**

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	I	**COMPUTER AIDED ENGINEERING DRAWING PRACTICE**	**RT21036**	19/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
72 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

PSO2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

PSO3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

To enhance the student's knowledge and skills in engineering drawing and to introduce drafting packages and commands for computer aided drawing and modelling.

Course Outcomes:

CO1: Draw projection of solids by using auxiliary plane method.

CO2: Draw different views on sections, development and interpenetration of solids.

CO3: Understand the concept of Isometric and perspective projections.

CO4: Draw two-dimensional sketches, views in CAD environment.

CO5: Create geometrical model of simple solids and machine parts.

CO6: Draw isometric projections, orthographic projections from isometric projections using CAD

.

UNIT-I:

Objective: The knowledge of projections of solids is essential in 3D modelling and animation. The student will

be able to draw projections of solids. The objective is to enhance the skills they already acquired in their earlier

course in drawing of projection.

PROJECTIONS OF SOLIDS: Projections of Regular Solids inclined to both planes – Auxiliary Views.

UNIT-II:

The knowledge of sections of solids and development of surfaces is required in designing and manufacturing of

the objects. Whenever two or more solids combine, a definite curve is seen at their intersection.

SECTIONS OF SOLIDS: Sections and Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid,

Cone – Auxiliary views.

DEVELOPMENT AND INTERPENETRATION OF SOLIDS: Development of Surfaces of Right Regular Solids – Prisms, Cylinder, Pyramid Cone and their parts.

UNIT-III:

The intersection of solids also plays an important role in designing and manufacturing. The objective is to impart

this knowledge through this topic. A perspective view provides a realistic 3D View of an object. The objective is

to make the students learn the methods of Iso and Perspective views.

INTERPENETRATION OF RIGHT REGULAR SOLIDS: Intersection of Cylinder Vs Cylinder, Cylinder Vs

Prism, Cylinder Vs Cone, Prism Vs Cone.

PERSPECTIVE PROJECTIONS: Perspective View: Points, Lines, Plane Figures and Simple Solids, Vanishing Point Methods (General Method only).

In part B computer aided drafting is introduced.

UNIT IV:

The objective is to introduce various commands in AutoCAD to draw the geometric entities and to create 2D and 3D wire frame models.

INTRODUCTION TO COMPUTER AIDED DRAFTING: Generation of points, lines, curves, polygons, dimensioning. Types of modeling : object selection commands – edit, zoom, cross hatching, pattern filling, utility
commands, 2D wire frame modeling, 3D wire frame modeling,.

UNIT V:

By going through this topic the student will be able to understand the paper-space environment thoroughly.

VIEW POINTS AND VIEW PORTS: view point coordinates and view(s) displayed, examples to exercise different options like save, restore, delete, joint , single option.

UNIT VI:

The objective is to make the students create geometrical model of simple solids and machine parts and display the
same as an Isometric, Orthographic or Perspective projection.

COMPUTER AIDED SOLID MODELLING: Isometric projections, orthographic projections of isometric projections, Modeling of simple solids, Modeling of Machines & Machine Parts.

Text Books :

1. Engineering drawing by N.D Bhatt, Charotar publications.
2. Engineering Graphics, K.C. john, PHI Publications

Program Name: ME-A&B　　　　Faculty Name: C.Srilatha/Ch. Saraswathi

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	I	**MECHANICS OF SOLIDS & METALLURGY LAB**	RT21038	19/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
33 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Specify, architect, design and analyze systems that efficiently generate, transmit, distribute and utilize electrical power.

PSO2. Analyze and design modern electrical drive systems and modern lighting systems.

PSO3. Understand the principles and construction of electrical machines and determine their performance through testing.

PSO4. Specify, design, implement and test analog and embedded signal processing electronic systems using the state of the art components and software tools.

Course Objectives:

Course Objective: To impart practical exposure on the microstructures of various materials and their hardness evaluation. Also to impart practical knowledge on the evaluation of material properties through various destructive testing procedures.

Course Outcomes:

CO1: Predict and interpret the behavior of the material under normal external loads, impact loads and torsion.
CO2: Characterize the microstructures of different ferrous and non-ferrous metals & identify the effect of heat treatment on the hardness of steels.

SYLLABUS:

(A) MECHNICS OF SOLIDS LAB :

1. Direct tension test
2. Bending test on
a) Simple supported
b) Cantilever beam
3. Torsion test
4. Hardness test
a) Brinells hardness test
b) Rockwell hardness test
5. Test on springs
6. Compression test on cube
7. Impact test
8. Punch shear test

(B) METALLURGY LAB:

1. Preparation and study of the Micro Structure of pure metals like Iron, Cu and Al.
2. Preparation and study of the Microstructure of Mild steels, low carbon steels, high – C steels.
3. Study of the Micro Structures of Cast Irons.
4. Study of the Micro Structures of Non-Ferrous alloys.
5. Study of the Micro structures of Heat treated steels
6. Hardenability of steels by Jominy End Quench Test.
7. To find out the hardness of various treated and untreated steels.

Program Name: ME-A&B Faculty Name: A Sai Pallavi/R.Rajesh/Sk.M Ahmed

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	I	**BASIC ELECTRICAL & ENGG. LAB**	**RT21037**	19/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
33 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Specify, architect, design and analyze systems that efficiently generate, transmit, distribute and utilize electrical power.

PSO2. Analyze and design modern electrical drive systems and modern lighting systems.

PSO3. Understand the principles and construction of electrical machines and determine their performance through testing.

PSO4. Specify, design, implement and test analog and embedded signal processing electronic systems using the state of the art components and software tools.

Course Objectives:

- To predetermine the efficiency of dc shunt machine using Swinburne's test.
- To predetermine the efficiency and regulation of 1-phase transformer with O.C and S.C tests.
- To obtain performance characteristics of DC shunt motor &3-phase induction motor.
- To find out regulation of an alternator with synchronous impedance method.
- To control speed of dc shunt motor using speed control methods.
- To find out the characteristics of PN junction diode & transistor
- To determine the ripple factor of half wave & full wave rectifiers.

Course Outcomes:

CO1: Find out the efficiency of dc shunt machine without actual loading of the machine.

CO2: Estimate the efficiency and regulation for different load conditions and power factors of single phase transformer with OC and SC test.

CO3 Analyse the performance characteristics and to determine efficiency of DC shunt motor &3-phase induction motor.

CO4: Pre-determine the regulation of an alternator by synchronous impedance method.

CO5: Control the speed of dc shunt motor using speed control methods

CO6: Find out the characteristics of PN junction diode & transistor

SYLLABUS:

1. Swinburne's test on D.C. Shunt machine (Predetermination of efficiency of a given D.C.Shunt machine working as motor and generator).
2. OC and SC tests on single phase transformer (Predetermination of efficiency and regulation at given power
factors).

3. Brake test on 3-phase Induction motor (Determination of performance characteristics)
4. Regulation of alternator by Synchronous impedance method.
5. Speed control of D.C. Shunt motor by
a) Armature Voltage control b) Field flux control method
6. Brake test on D.C. Shunt Motor.

Section B: Electronics Engineering.

The following experiments are required to be conducted as compulsory experiments:
1.PN junction diode characteristics a) Forward bias b) Reverse bias (Cut in voltage and resistance calculations)
2. Transistor CE characteristics (Input and output)
3. Half wave rectifier with and with out filters.
4. Full wave rectifier with and with out filters.
5. CE amplifiers.
6. OP- Amp applications (inverting, non inverting, integrator and differentiator)

Program Name: MECHANICAL-A&B Faculty Name CH.JEEVAN PAUL

.Class	Semester	Title of The Paper	Paper Code	W.E.F
II	II	KINEMATICS OF MACHINARY	R1622021	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
75 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

PSO2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

PSO3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

1.The students completing this course are expected to understand the nature and role of the kinematics of machinery, the mechanisms and machines.
2.The course includes velocity and acceleration diagrams, analysis of mechanisms joints, Cams and their applications.
3.It exposes the students to various kinds of power transmission devices like belt, rope , chain and gear drives and their working principles and their merits and demerits.

Course Outcomes:

- **CO 1:** To make student understand the purpose of kinematics, Kinematic joint and mechanism and to study the relative motion of parts in a machine without taking into consideration the forces involved.
- **CO 2:** To make student understand various mechanisms for straight line motion and their applications
  including steering mechanism
- **CO 3:**To make student understand the velocity and acceleration concepts and the methodology using graphical methods and principles and application of four bar chain. To understand the application of slider crank mechanism etc. and study of plane motion of the body.
- **CO 4:** To understand the theories involved in cams. Further the students are exposed to the applications of cams and their working principles.
- **CO 5:** To understand gears, power transmission through different types of gears including gear profiles and its efficiency
- **CO 6:** To understand various power transmission mechanisms and methodologies and working principles

Syllabus:

UNIT – I

MECHANISMS : Elements or Links – Classification – Rigid Link, flexible and fluid link – Types of kinematic pairs – sliding, turning, rolling, screw and spherical pairs – lower and higher pairs – closed and open pairs – constrained motion – completely, partially or successfully constrained and incompletely constrained . Grublers criterion , Grashoff's law , Degrees of freedom, Kutzbach criterion for planar mechanisms, Mechanism and machines – classification of machines – kinematic chain – inversion of mechanism – inversion of mechanism – inversions of quadric cycle, chain – single and double slider crank chains.

UNIT – II

LOWER PAIR MECHANISM: Exact and approximate copiers and generated types – Peaucellier, Hart and Scott Russel – Grasshopper – Watt T. Chebicheff and Robert Mechanisms and straight line motion, Pantograph. Conditions for correct steering – Davis Steering gear, Ackermans steering gear – velocity ratio; Hooke's Joint: Single and double – Universal coupling–application–problems.

UNIT – III

KINEMATICS: Velocity and acceleration – Motion of a link in machine – Determination of Velocity and acceleration diagrams – Graphical method – Application of relative velocity method four bar chain. Velocity and acceleration analysis of for a given mechanism, Kleins construction, Coriolis acceleration, determination of Coriolis component of acceleration.

Plane motion of body: Instantaneous centre of rotation, centroids and axodes – relative motion between two bodies – Three centres in line theorem – Graphical determination of instantaneous centre, diagrams for simple mechanisms and determination of angular velocity of points and links.

UNIT-IV

CAMS

Definitions of cam and followers – their uses – Types of followers and cams – Terminology –Types of follower motion: Uniform velocity, Simple harmonic motion and uniform acceleration and retardation. Maximum velocity and maximum acceleration during outward and return strokes in the above 3 cases. Analysis of motion of followers: Roller follower – circular cam with straight, concave and convex flanks.

UNIT – V

GEARS

Higher pairs, friction wheels and toothed gears–types – law of gearing, condition for constant velocity ratio for transmission of motion, Form of teeth: cycloidal and involute profiles. Velocity of sliding – phenomena of interferences – Methods of interference. Condition for minimum number of teeth to avoid interference, expressions for arc of contact and path of contact – Introduction to Helical, Bevel and worm gearing.

UNIT – VI

Power Transmissions : Introduction, Belt and rope drives, selection of belt drive- types of belt drives,V-belts, materials used for belt and rope drives, velocity ratio of belt drives, slip of belt, creep of belt, tensions for flat belt drive, angle of contact, centrifugal tension, maximum tension of belt, Chains- length, angular speed ratio,classification of chains.

Introduction to gear Trains, Train value, Types – Simple and reverted wheel train – Epicyclic gear Train. Methods of finding train value or velocity ratio – Epicyclic gear trains. Selection of gear box-Differential gear foran automobile.

Text Books :

1. Theory of Machines / S.S Rattan/ Mc. Graw Hill
2. Mechanism and machine theory /Ashok G. Ambedkar/PHI Publications.

References :

1. Mechanism and Machine Theory / JS Rao and RV Dukkipati / New Age
2. Theory of Machines / Shigley / MGH
3. Theory of Machines / Thomas Bevan / CBS Publishers
4. Theory of machines / Khurmi/S.Chand.

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Program Name: MECHANICAL Faculty Name: G.RAVALI

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	II	THERMAL ENGINEERING-I	R16220302	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
80 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

25. **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
26. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
27. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
28. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
29. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
30. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
31. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
32. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
33. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

34. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
35. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
36. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.
2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs
3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

1.To make the student learn and understand the reasons and affects of various losses that occur in the actual engine operation

2.To familiarize the student with the various engine systems along with their function and necessity.

3.To learn about normal combustion phenomenon and knocking in S.I. and C.I. Engines and to ind the several engine operating parameters that affect the smooth engine operation.

4.To make the student learn to perform testing on S.I and C.I Engines for the calculations of performance and emission parameters.

5.To make students learn about different types of compressors and to calculate power and efficiency of reciprocating compressors.

6.To make students learn mechanical details, and to calculate power and efficiency of rotary compressors

Course Outcomes:

1. Explain the air standard cycles and discuss the parameters differentiate actual cycles from air standard cycles.
2. Demonstrate knowledge on operating conditions and characteristics of internal combustion engines.
3. Understand the concept of combustion and knocking parameters.
4. Calculate Performance parameters like Brake power, Indicated power & various efficiencies.
5. Understand the working principle of reciprocating compressors.
6. Apply thermodynamic laws in engineering applications and demonstrate working of compressors which are involving energy flows.

SYLLABUS:

UNIT – I

Actual Cycles and their Analysis: Introduction, Comparison of Air Standard and Actual Cycles, Time Loss Factor, Heat Loss Factor, Exhaust Blowdown-Loss due to Gas exchange process, Volumetric Efficiency. Loss due to Rubbing Friction, Actual and Fuel-Air Cycles of CI Engines.

UNIT – II

I. C. ENGINES : Classification - Working principles, Valve and Port Timing Diagrams, - Engine systems – Fuel, Carburettor, Fuel Injection System, Ignition, Cooling and Lubrication, principle of wankle engine, principles of supercharging and turbo charging.

UNIT – III

Combustion in S.I. Engines : Normal Combustion and abnormal combustion – Importance of flame speed and effect of engine variables – Types of Abnormal combustion, pre-ignition and knocking (explanation of) – Fuel requirements and fuel rating, anti knock additives – combustion chamber – requirements, types.

Combustion in C.I. Engines : Four stages of combustion – Delay period and its importance – Effect of engine variables – Diesel Knock– Need for air movement, suction, compression and combustion induced turbulence – open and divided combustion chambers and nozzles used – fuel requirements and fuel rating.

UNIT – IV

Measurement, Testing and Performance: Parameters of performance - measurement of cylinder pressure, fuel consumption, air intake, exhaust gas composition, Brake power – Determination of frictional losses and indicated power – Performance test – Heat balance sheet and chart.

UNIT – V

COMPRESSORS – Classification –positive displacement and roto dynamic machinery – Power producing and power absorbing machines, fan, blower and compressor – positive displacement and dynamic types – reciprocating and rotary types.

Reciprocating: Principle of operation, work required, Isothermal efficiency, volumetric efficiency and effect of clearance, multi stage compression, undercooling, saving of work, minimum work condition for two stage compression.

UNIT VI

Rotary (Positive displacement type) : Roots Blower, vane sealed compressor, Lysholm compressor – mechanical details and principle of working – efficiency considerations. Dynamic Compressors: Centrifugal compressors: Mechanical details and principle of operation – velocity and pressure variation. Energy transfer-impeller blade shape-losses, slip factor, power input factor, pressure coefficient and adiabatic coefficient – velocity diagrams – power.

Axial Flow Compressors: Mechanical details and principle of operation – velocity triangles and energy transfer per stage degree of reaction, work done factor - isentropic efficiency- pressure rise calculations – Polytropic efficiency.

Program Name: MECH Faculty Name: C.SRILATHA

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	II	Production Technology	R1622033	18/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
65 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

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PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

To impact basic knowledge and understand about the primary manufacturing processes such as casting, joining, forming and powder metallurgy and their relevance in current manufacturing industry to introduce processing methods of plastics.

Course Outcomes:

- To make the understand fundamentals of castings.
- To provide insight into sand casting and introduce other casting processes.
- To impart fundamentals of gas welding and arc welding.
- To teach principles of advanced welding processes and their applications.
- To impart knowledge on bulk forming processes.
- To provide understanding of various sheet metal forming and processing of plastics.

UNIT I: CASTING

Steps involved in making a casting- Advantages of casting and its applications. Patterns and pattern making- Types of patterns- Materials used for patterns, pattern allowances and their construction, Principles of Gating, Gating ratio and design of Gating systems.

UNIT II:

Methods of melting and types of furnaces, Solidification of castings, Solidification of pure metals and alloys, short & long freezing range alloys. Risers- Types, function and design, casting design

considerations, Basic principles and applications of Centrifugal casting, Die casting and Investment casting.

UNIT III: Welding

Classification of welding processes, types of welded joints and their characteristics, Gas welding, Different types of flames and uses, Oxy – Acetylene Gas cutting. Basic principles of Arc welding, Manual metal arc welding, submerged arc welding, and Inert Gas welding- TIG & MIG welding.

UNIT IV:

Resistance welding, Solid state welding processes- Friction welding, Friction stir welding, Forge welding, Explosive welding; Thermit welding, Plasma welding, Laser welding, electron beam welding, Soldering & Brazing.

Heat affected zones in welding; pre & post heating, Weldability of metals, welding defects – causes and remedies – destructive and non destructive testing of welds, Design of welded joints.

UNIT V:

Plastic deformation in metals and alloys, Hot working and Cold working, Strain hardening and Annealing. Bulk forming processes: Forging - Types Forging, Smith forging, Drop Forging, Roll forging, Forging hammers, Rotary forging, forging defects; Rolling – fundamentals, types of rolling mills and products, Forces in rolling and power requirements. Extrusion and its characteristics. Types of extrusion, Impact extrusion, Hydrostatic extrusion; Wire drawing and Tube drawing.

Introduction to powder metallurgy – compaction and sintering, advantages and applications.

UNIT VI:

Sheet metal forming - Blanking and piercing, Forces and power requirement in these operations, Deep drawing, Stretch forming, Bending, Spring back and its remedies, Coining, Spinning, Types of presses and press tools. High energy rate forming processes: Principles of explosive forming, electromagnetic forming, Electro hydraulic forming, rubber pad forming, advantages and limitations. Processing of Plastics: Types of Plastics, Properties, Applications and their processing methods, Blow and Injection moulding.

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Program Name: **Mechanical Engineering** Faculty Name: **M. MADHU SUDHANA RAO**

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	II	DESIGN OF MACHINE MEMBERS-I	RT22034	11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
92 Hours	Theory 6	Practical	3	Internal 30	External 70	3

<u>PROGRAMME OUTCOMES:</u>

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES:

PSO1.Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

PSO2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

PSO3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices

COURSE OBJECTIVES:

1. The student shall gain appreciation and understanding of the design function in mechanical engineering, the steps involved in designing and the relation of design activity with manufacturing activity
2. Selection of proper materials to different machine elements based on their physical and mechanical properties.
3. Learn and understanding of the different types of failure modes and criteria.
4. Procedure for the different machine elements such as fasteners, shafts, couplings, keys, axially loaded joints etc.

COURSE OUTCOMES:

CO1: Apply the design procedure to engineering problems, including the consideration of technical and manufacturing constraints.

CO2: Explain the component subjected to loads and identify the failure criteria and design the elements for strength, stiffness and fatigue.

CO3: Calculate the stresses and strains induced in machine elements including riveted, bolted and welded joints.

CO4: Compute combined loading for strength and rigidity of keys, cotters, shafts to ensure safe design.

CO5: Categorize various types of coupling joints subjected to torsional loading to calculate the induced stresses developed to ensure safe design.

CO6: Design of various springs under fatigue loading to calculate static and dynamic stresses developed.

COURSE CONTENT:

UNIT – I INTRODUCTION: General considerations in the design of Engineering Materials and their properties – selection –Manufacturing consideration in design, tolerances and fits –BIS codes of steels. **STRESSES IN MACHINE MEMBERS:** Simple stresses – combined stresses – torsional and bending stresses – impact stresses – stress strain relation – various theories of failure – factor of safety – design for strength and rigidity – preferred numbers. The concept of stiffness in tension, bending, torsion and combined situations – static strength design based on fracture toughness.

UNIT – II STRENGTH OF MACHINE ELEMENTS: Stress concentration – theoretical stress concentration factor – fatigue stress concentration factor notch sensitivity – design for fluctuating stresses – endurance limit – estimation of endurance strength – Goodman's line – Soderberg's line – modified Goodman's line.

UNIT – III Riveted and welded joints : design of joints with initial stresses – eccentric loading. Bolted joints – design of bolts with pre-stresses – design of joints under eccentric loading – locking devices – both of uniform strength, different seals.

UNIT – IV KEYS, COTTERS AND KNUCKLE JOINTS: Design of keys-stresses in keys-cotter joints-spigot and socket, sleeve and cotter, jib and cotter joints- knuckle joints. SHAFTS: Design of solid and hollow shafts for strength and rigidity – design of shafts for combined bending and axial loads – shaft sizes – BIS code. Use of internal and external circlips, gaskets and seals (stationary & rotary).

UNIT – V SHAFT COUPLING: Rigid couplings – muff, split muff and flange couplings, flexible couplings – flange coupling (modified).

UNIT – VI MECHANICAL SPRINGS: Stresses and deflections of helical springs – extension - compression springs – springs for fatigue loading, energy storage capacity – helical torsion springs – co-axial springs, leaf springs. Note: Design data book is NOT Permitted for examination

Text Books:

1. Machine Design/V.Bandari/ TMH Publishers

2. Machine design / NC Pandya& CS Shah/Charotar Publishing House Pvt. Limited

3. Design data book of Engineers

References: 1. Design of Machine Elements / V.M. Faires/McMillan

2. Machine design / Schaum Series/McGrawHill Professional

3. Machine Design/ Shigley, J.E/McGraw Hill.

4. Design data handbook/ K.Mahadevan& K. Balaveera Reddy/ CBS publishers.

5. Design of machine elements-Spotts/Pearson Publications

6. Machine Design –Norton/ Pearson publishers

Program Name: **MECHANICAL** Faculty Name: **VIJAY SRIHARSHA TANGELLA**

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	II	MACHINE DRAWING	R1621035	19/11/2018

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
69 Hours	6		3	30	70	3

PROGRAMME OUTCOMES:

PO1. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES:

PSO 1: Ability to analyze and solve the problems in the domains of design, thermal and allied fields.

PSO 2: Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs.

PSO 3: Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

COURSE OBJECTIVES:

The student will acquire knowledge of fastening arrangements such as welding, riveting the different styles of attachment for shaft. The student also is enabled to prepare the assembly of various machine or engine components and miscellaneous machine components.

COURSE OUTCOMES:

CO1: Remember the conventional representations of materials and machine elements.

CO2: Draw different views of thread profiles such as V-sharp, whit-worth, Buttress, square, ACME, worm, Bolts & Nuts, keys, cotters, pin joints, Riveted joints, shaft couplings and Bearings.

CO3: Interpret assembly drawings such as Engine parts, Machine tool parts & accessories, Miscellaneous parts (screw jack, swivel bearing, pipe vice) with moderate complexity

SYLLABUS:

Machine Drawing Conventions:

Need for drawing conventions – introduction to IS conventions

a) Conventional representation of materials, common machine elements and parts such as screws, nuts, bolts, keys, gears, webs, ribs.

b) Types of sections – selection of section planes and drawing of sections and auxiliary sectional views. Parts not usually sectioned.
c) Methods of dimensioning, general rules for sizes and placement of dimensions for holes, centers, curved and tapered features.
d) Title boxes, their size, location and details - common abbreviations & their liberal usage.
e) Types of Drawings – working drawings for machine parts.

I. Drawing of Machine Elements and simple parts

Objective: To provide basic understanding and drawing practice of various joint, simple mechanical parts Selection of Views, additional views for the following machine elements and parts with every drawing proportion.

a) Popular forms of Screw threads, bolts, nuts, stud bolts, tap bolts, set screws.
b) Keys, cottered joints and knuckle joint.
c) Riveted joints for plates
d) Shaft coupling, spigot and socket pipe joint.
e) Journal, pivot and collar and foot step bearings.

II. Assembly Drawings:

Objective: The student will be able to draw the assembly from the individual part drawing.

Drawings of assembled views for the part drawings of the following using conventions and easy drawing proportions.

a) Engine parts – stuffing boxes, cross heads, Eccentrics, Petrol Engine connecting rod, piston assembly.
b) Other machine parts - Screws jacks, Machine Vices Plummer block, Tailstock.
c) Valves: Steam stop valve, spring loaded safety valve, feed check valve and air cock.

NOTE: First angle projection to be adopted. The student should be able to provide working drawings of actual parts.

Program Name: ME-A&B   Faculty Name: N.V. Malavika/C.Srilatha

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	II	Production Technology	R16	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
33 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Specify, architect, design and analyze systems that efficiently generate, transmit, distribute and utilize electrical power.

PSO2. Analyze and design modern electrical drive systems and modern lighting systems.

PSO3. Understand the principles and construction of electrical machines and determine their performance through testing.

PSO4. Specify, design, implement and test analog and embedded signal processing electronic systems using the state of the art components and software tools.

Course Objectives:

To impart hands-on practical exposure on manufacturing processes and equipment.

Course Outcomes:

CO1. Illustrate the basic manufacturing processes like Casting, Welding, Metal Forming and Plastics moulding.

SYLLABUS:

I. METAL CASTING :

1. Pattern Design and making - for one casting drawing.
2. Sand properties testing - for strength and permeability
3. Mould preparation, Melting and Casting

II WELDING:

1. Gas welding
2. Gas cutting
3. Manual metal arc welding - Lap & Butt Joints
4. TIG/MIG Welding
5. Resistance Spot Welding
6. Brazing and soldering

III METAL FORMING AND POWDER METALLURGY:

1. Blanking & Piercing operations and study of simple, compound and progressive dies.
2. Deep drawing and extrusion operations.
3. Bending and other operations
4. Basic powder compaction and sintering

IV PROCESSING OF PLASTICS

1. Injection Moulding
2. Blow Moulding

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO
COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: mechanical engineering   Faculty Name: V.Chandrika

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	II	FM&HM LAB		19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
30	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

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PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.
PSO2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs
PSO3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices

Course Objectives:

To impart practical exposure on the performance evaluation methods of various flow measuring equipment and hydraulic turbines and pumps.

Course Outcomes:

Understand the performance of different turbines,pumps and floe measuring equipments.

LIST OF EXPERIMENTS

1. Impact of jets on Vanes.
2. Performance Test on Pelton Wheel.
3. Performance Test on Francis Turbine.
4. Performance Test on Kaplan Turbine.
5. Performance Test on Single Stage Centrifugal Pump.
6. Performance Test on Multi Stage Centrifugal Pump.
7. Performance Test on Reciprocating Pump.
8. Calibration of Venturimeter.
9. Calibration of Orifice meter.
10. Determination of friction factor for a given pipe line.
11. Determination of loss of head due to sudden contraction in a pipeline.
12. Turbine flow meter.

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO
COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: MECHANICAL-A&B Faculty Name CH.JEEVAN PAUL

.Class	Semester	Title of The Paper	Paper Code	W.E.F
III	I	DYNAMICS OF MACHINARY	R1631031	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
75 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

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PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

PSO2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

PSO3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

1. To equip the student with fundamental knowledge of dynamics of machines so that student can appreciate problems of dynamic force balance, transmissibility of forces, isolation of systems, vibrations.
2. Develop knowledge of analytical and graphical methods for calculating balancing of rotary and reciprocating masses.
3. Develop understanding of vibrations and its significance on engineering design
4. Develop understanding of dynamic balancing, flywheel analysis, gyroscopic forces and moments

Course Outcomes:

- **CO 1:** Analyze stabilization of sea vehicles, aircrafts and automobile vehicles
- **CO 2:** Compute frictional losses, torque transmission of mechanical systems.
- **CO 3:** Analyze dynamic force analysis of slider crank mechanism and design of flywheel.
- **CO 4:** Understand how to determine the natural frequencies of continuous systems starting from the general equation of displacement.
- **CO 5:** Understand balancing of reciprocating and rotary masses.

Syllabus:

UNIT – I

PRECESSION: Gyroscopes, effect of precession motion on the stability of moving vehicles such as motor car, motor cycle, aero planes and ships, static and dynamic force analysis of planar mechanisms, (Demonstration of models in video show).

UNIT – II

FRICTION: Inclined plane, friction of screw and nuts, pivot and collar, uniform pressure, uniform wear, friction circle and friction axis: lubricated surfaces, boundary friction, film lubrication.

CLUTCHES: Friction clutches- single disc or plate clutch, multiple disc clutch, cone clutch, centrifugal clutch. General description and operation of dynamometers: Prony, Rope brake, Epicyclic, Bevis Gibson and belt transmission,

UNIT – III

TURNING MOMENT DIAGRAMS: Dynamic force analysis of slider crank mechanism**,** inertia torque, angular velocity and acceleration of connecting rod, crank effort and turning moment diagrams – fluctuation of energy – fly wheels and their design.

UNIT-IV

GOVERNERS: Watt, porter and proell governors, spring loaded governors – Hartnell and Hartung with auxiliary springs. sensitiveness, isochronism and hunting.

UNIT – V

BALANCING: Balancing of rotating masses single and multiple – single and different planes, use analytical and graphical methods. Primary, secondary, and higher balancing of reciprocating masses. analytical and graphical methods, unbalanced forces and couples – examination of "V" multi cylinder in line and radial engines for primary and secondary balancing, locomotive balancing, hammer blow, swaying couple, variation of tractive effort.

UNIT – VI

VIBRATIONS: Free Vibration of spring mass system –Natural frequency-types of damping – damped free vibration, Simple problems on forced damped vibration, vibration isolation and transmissibility transverse loads, vibrations of beams with concentrated and distributed loads. Dunkerly's methods, Raleigh's method, whirling of shafts, critical speeds, torsional vibrations, two and three rotor systems.

Text Books :

1. Theory of Machines / S.S Rattan/ Mc. Graw Hill
2. Mechanism and machine theory /Ashok G. Ambedkar/PHI Publications.

References :

1. Mechanism and Machine Theory / JS Rao and RV Dukkipati / New Age
2. Theory of Machines / Shigley / MGH
3. Theory of Machines / Thomas Bevan / CBS Publishers
4. Theory of machines / Khurmi/S.Chand.

Program Name: Mechanical Faculty Name: A.V.A.R Durga Rao

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	I	Metal Cutting and Machine Tools	R1631032	11/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
62 Hours	Theory 4	Practical 2	3	Internal 30	External 70	4

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

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PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to apply the acquired Mechanical Engineering knowledge to solve engineering problems utilizing advanced technology for the advancement of society and oneself with confidence.
2. Successfully apply the principles of drafting and design, to analyze and evaluate using tools to solve real time problems of structural, thermal and allied field problems resulting in significant societal development.
3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices and to become responsible citizens with ethical values.

Course Objectives:

1. The course provides students with fundamental knowledge and principles in material removal processes.
2. In this course, the students apply the fundamentals and principles of metal cutting to practical applications through multiple labs using lathes, milling machines, grinding machines, and drill presses, Computer Numerical Control etc
3. To demonstrate the fundamentals of machining processes and machine tools.
4. To develop knowledge and importance of metal cutting parameters.
5. To develop fundamental knowledge on tool materials, cutting fluids and tool wear mechanisms.
6. To apply knowledge of basic mathematics to calculate the machining parameters for different machining processes.

Course Outcomes:

1.Discuss the fundamentals of machining process.

2. Describe the overview of the lathe machine.
3. Explain the working principles of cutting machines like Shaping, Planning, Slotting, Drilling.
4. Classify the milling machines and explain the working principle.
5. Differentiate the finishing processes like grinding, lapping, honing and broaching.
6. Demonstrate jigs and Fixtures for simple parts and explain the working of CNC Machines.

UNIT I

FUNDAMENTALS OF MACHINING

Elementary treatment of metal cutting theory – element of cutting process – geometry of single point tool angles, chip formation and types of chips – built up edge and its effects chip breakers,mechanics of orthogonal cutting – Merchant's force diagram, cutting forces, cutting speeds, feed, depth of cut, tool life, coolants, tool materials.

UNIT II: LATHE MACHINES

Engine lathe – principle of working, specification of lathe – types of lathe – work holders tool holders – box tools taper turning, thread turning – for lathes and attachments, constructional features of speed gear box and feed gear box. Turret and capstan lathes – collet chucks – other work holders – tool holding devices – box and tool layout. Principal features of automatic lathes – classification – single spindle and multi-spindle automatic lathes – tool layout and cam design for automats.

UNIT III: SHAPING, SLOTTING AND PLANNING MACHINES

Principles of working – principal parts – specifications, operations performed, machining time calculations.

DRILLING & BORING MACHINES:

Principles of working, specifications, types, operations performed – tool holding devices – twist drill – Boring Machines – fine Boring Machines – jig boring machine, deep hole Drilling Machine.

UNIT IV: MILLING MACHINES

Principles of working – specifications – classification of Milling, Machines – Principle features of horizontal, vertical and universal Milling Machine, machining operations, types of cutters, geometry of milling cutters – methods of indexing, accessories to milling machines.

UNIT V: FINISHING PROCESSES

Theory of grinding – classification of grinding machines, cylindrical and surface grinding machines, tool and cutter grinding machines, different types of abrasives, bonds, specification and selection of a grinding wheel. Lapping, Honing & Broaching operations, comparison to grinding.

UNIT VI: JIGS & FIXTURES

Principles of design of jigs and fixtures and uses, classification of jigs & fixtures, principles of location and clamping, types of clamping & work holding devices, typical examples of jigs and fixtures.

CNC MACHINE TOOLS: CNC Machines, working principle, classification, constructional features of CNC machines, CNC controller, types of motion controls in CNC machines, applications of CNC machines.

Program Name: **Mechanical Engineering** Faculty Name: **M. MADHU SUDHANA RAO**

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	I	DESIGN OF MACHINE MEMBERS-II	RT31033	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
85 Hours	Theory 6	Practical	3	Internal 30	External 70	3

<u>PROGRAMME OUTCOMES:</u>

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

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PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES:

PSO1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

PSO2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

PSO3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices

COURSE OBJECTIVES:

- This course gives the insight of slider and roller bearings and the life prediction.
- Learn to design I.C engine parts
- Design the mechanical systems for power transmission elements such as gears, belts, ropes, chains, keys and levers

COURSE OUTCOMES:

1. Apply the knowledge to select the suitable bearing based on the application of the loads and predict the life of the bearing.

2. Design IC Engine parts.

3. Design curved beams and crane hooks.

4. Design power transmission elements such as belts, chains, pulleys, ropes and power screws.

5. Understand the gear tooth profiles, involute profile basics, Influence of number of teeth and pressure angle, Analysis of forces on spur, and helical gears. Bending and contact stress in gear tooth. Gear quality and selection aspects.

6. Design levers, brackets, crank pin and Wire Ropes.

COURSE CONTENT

UNIT – I BEARINGS: Classification of bearings- applications, types of journal bearings – lubrication – bearing modulus – full and partial bearings – clearance ratio – heat dissipation of bearings, bearing materials – journal bearing design – ball and roller bearings – static loading of ball & roller bearings, bearing life.

UNIT – II ENGINE PARTS: Connecting Rod: Thrust in connecting rod – stress due to whipping action on connecting rod ends – cranks and crank shafts, strength and proportions of over hung and center cranks – crank pins, crank shafts. Pistons, forces acting on piston – construction design and proportions of piston, cylinder, cylinder liners,

UNIT – III Design of curved beams: introduction, stresses in curved beams, expression for radius of neutral axis for rectangular, circular, trapezoidal and t-section, design of crane hooks, c –clamps.

UNIT – IV POWER TRANSMISSIONS SYSTEMS, PULLEYS: Transmission of power by belt and rope drives , transmission efficiencies, belts – flat and v types – ropes - pulleys for belt and rope drives, materials, chain drives DESIGN OF POWER SCREWS: Design of screw, square ACME, buttress screws, design of nut, compound screw, differential screw, ball screw- possible failures.

UNIT – V SPUR & HELICAL GEAR DRIVES: Spur gears- helical gears – load concentration factor – dynamic load factor, surface compressive strength – bending strength – design analysis of spur gears – estimation of centre distance, module and face width, check for plastic deformation, check for dynamic and wear considerations.

UNIT – VI MACHINE TOOL ELEMENTS: Levers and brackets: design of levers – hand levers-foot lever – cranked lever – lever of a lever loaded safety valve- rocker arm straight – angular- design of a crank pin – brackets- hangers, wall boxes. Wire Ropes: Construction, Designation, Stresses in wire ropes, rope sheaves and drums.

Note: Design data book is permitted for examination

Text Books:

1. Machine Design/V.Bandari/TMH Publishers

2. Machine Design/ NC Pandya & CS Shaw/ Charotar publishers

3. Design data book.

References:

1. Machine Design: An integrated Approach / R.L. Norton / Pearson Education

2. Mech. Engg. Design / JE Shigley/Tata McGraw Hill education

3. Design of machine elements- spots/Pearson Publications

4. Machine Design-Norton/Pearson Publications

Program Name: **MECHANICAL** Faculty Name: **VIJAY SRIHARSHA TANGELLA**

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	I	OPERATIONS RESEARCH	R1631034	20/06/2018

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
70 Hours	5		3	30	70	3

PROGRAMME OUTCOMES:

PO1. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

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PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES:

PSO 1: Ability to analyze and solve the problems in the domains of design, thermal and allied fields.

PSO 2: Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs.

PSO 3: Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

COURSE OBJECTIVES:

To learn the importance of Operations Research in the design, planning, scheduling, manufacturing and business applications and to use the various techniques of Operations Research in solving such problems.

COURSE OUTCOMES:

CO 1: Understand the concept of mathematical models such as formulation of linear Programming problems, Graphical Method and applying the optimization techniques like Simplex Method, Artificial variable – Big M method, Two-Phase Method and Duality.

CO 2: Analyzing and applying the general Mathematical model of transportation problem, assignment problem, travelling salesman problem, sequencing problem, replacement models etc. and their applications in Mechanical Engineering.

CO 3: Applying the replacement models etc. and their applications in Mechanical Engineering.

CO 4: Understand Game Theory and Queuing theory and their use and applications in Mechanical Engineering.

CO 5: Understand various inventory models and their applications.

CO 6: Understand different dynamic programming and simulation models and learn their applications in inventory and queuing problems.

COURSE CONTENT

UNIT I:

Development – definition– characteristics and phases – types of operation research models – applications.

ALLOCATION: Linear programming problem formulation – graphical solution – simplex method – artificial variables techniques -two–phase method, big-M method – duality principle.

UNIT II:

TRANSPORTATION PROBLEM: Formulation – optimal solution, unbalanced transportation problem – degeneracy, assignment problem – formulation – optimal solution - variants of assignment problem-traveling salesman problem.

SEQUENCING – Introduction – flow –shop sequencing – *n* jobs through two machines – *n* jobs through three machines – job shop sequencing – two jobs through 'm' machines.

UNIT III:

REPLACEMENT: Introduction – replacement of items that deteriorate with time – when money value is not counted and counted – replacement of items that fail completely, group replacement.

UNIT IV:

THEORY OF GAMES: Introduction – mini. max (max. mini) – criterion and optimal strategy – solution of games with saddle points – rectangular games without saddle points – 2 x 2 games – dominance principle – m x 2 & 2 x n games -graphical method.

WAITING LINES: Introduction – single channel – poison arrivals – exponential service times – with infinite population and finite population models– multichannel – poison arrivals – exponential service times with infinite population single channel poison arrivals.

UNIT V:

INVENTORY : Introduction – single item – deterministic models – purchase inventory models with one price break and multiple price breaks – shortages are not allowed – stochastic models – demand may be discrete variable or continuous variable – instantaneous production. Instantaneous demand and continuous demand and no set up cost. ABC & VED Analysis.

UNIT VI:

DYNAMIC PROGRAMMING: Introduction – Bellman's principle of optimality – applications of dynamic programming- capital budgeting problem – shortest path problem – linear programming problem.

SIMULATION: Definition – types of simulation models – phases of simulation– applications of simulation – inventory and queuing problems – advantages and disadvantages – simulation languages.

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VIJAYAWADA - 520 001.

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Program Name: MECHANICAL-A&B Faculty Name: D.PRASAD

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	I	THERMAL ENGINEERING-II	R1631035	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
73 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.
PSO2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs
PSO3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

This course is intended to provide basic knowledge of components being used in steam and gas power plant cycles.
To analyse the energy transfers and transformations in these components including individual Performance evaluation.

Course Outcomes:

- **CO 1:** Analyze the perfermance of Steam power plant.
- **CO 2:** Understand Classification of Boilers & Performance of Boilers.
- **CO 3:** Evaluate the stem turbines.
- **CO 4:** Classify & Applications the Steam Condensers.
- **CO 5:** Evaluate the performance of Gas Turbines.
- **CO 6:** Understand & Working of various Jet Propulsion units.

UNIT – I
BASIC CONCEPTS: Rankine cycle - schematic layout, thermodynamic analysis, concept of mean temperature of heat addition, methods to improve cycle performance – regeneration & reheating. combustion: fuels and combustion, concepts of heat of reaction, adiabatic flame temperature, Stoichiometry, flue gas analysis.
UNIT II
BOILERS : Classification – working principles of L.P & H.P boilers with sketches – mountings and accessories – working principles, boiler horse power, equivalent evaporation, efficiency and heat balance – draught, classification – height of chimney for given draught and discharge, condition for maximum discharge, efficiency of chimney – artificial draught, induced and forced.
UNIT – III
STEAM NOZZLES: Function of a nozzle – applications - types, flow through nozzles, thermodynamic analysis – assumptions -velocity of fluid at nozzle exit-Ideal and actual expansion in a nozzle, velocity coefficient, condition for maximum discharge, critical pressure ratio, criteria to decide nozzle shape: Super saturated flow, its effects, degree of super saturation and degree of under cooling - Wilson line.

STEAM TURBINES: Classification – impulse turbine; mechanical details – velocity diagram – effect of friction – power developed, axial thrust, blade or diagram efficiency – condition for maximum efficiency. De-laval turbine - methods to reduce rotor speed-velocity compounding, pressure compounding and velocity & pressure compounding, velocity and pressure variation along the flow – combined velocity diagram for a velocity compounded impulse turbine, condition for maximum efficiency

UNIT IV

REACTION TURBINE: Mechanical details – principle of operation, thermodynamic analysis of a stage, degree of reaction –velocity diagram – Parson's reaction turbine – condition for maximum efficiency – calculation of blade height.

STEAM CONDENSERS: Requirements of steam condensing plant – classification of condensers – working principle of different types – vacuum efficiency and condenser efficiency – air leakage, sources and its affects, air pump- cooling water requirement.

UNIT – V

GAS TURBINES: Simple gas turbine plant – ideal cycle, essential components – parameters of performance – actual cycle – regeneration, inter cooling and reheating –closed and semi-closed cycles – merits and demerits, types of combustion chambers

UNIT – VI

JET PROPULSION : Principle of operation –classification of jet propulsive engines – working principles with schematic diagrams and representation on t-s diagram - thrust, thrust power and propulsion efficiency – turbo jet engines – needs and demands met by turbo jet – schematic diagram, thermodynamic cycle, performance evaluation, thrust augmentation – methods.

Rockets : Application – working principle – classification – propellant type – thrust, propulsive efficiency – specific impulse – solid and liquid propellant rocket engines.

Text Books:

1. Thermodynamics and Heat Engines/R.Yadav, Volume -II /Central Publishing House
2. Gas Turbines /V.Ganesan /TMH
3. Heat Engineering /V.P Vasandani and D.S Kumar/Metropolitan Book Company, New Delhi

References:

1. Gas Turbines and Propulsive Systems /P.Khajuria & S.P.Dubey /Dhanpatrai
2. Gas Turbines / Cohen, Rogers and Saravana Muttoo / Addison Wesley – Longman
3. Thermal Engineering-R.S Khurmi, &J S Gupta/S.Chand.
4. Thermal Engineering-P.L.Bellaney/ Khanna publishers.
5. Thermal Engineering-M.L.Marthur & Mehta/Jain bros. Publishers
6. Thermal Engineering / RK Rajput/ Lakshmi Publications

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Program Name: MECHANICAL-A&B   Faculty Name: D.PRASAD

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	I	THERMAL ENGINEERING LAB	R1631038L	11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester External Lab Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hours		3	3	25	50	2

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

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PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.
PSO2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs
PSO3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

To provide hands on experience in operating various types of internal combustion Engines and understand their functioning and performance.

Course Outcomes:

CO 1: To Understand the working and performance of IC Engine.

Syllabus:

1. I.C. Engines valve / port timing diagrams.
2. Testing of Fuels – Viscosity, flash point/fire point, carbon residue, calorific value.
3. I.C. Engines performance test and Exhaust emission measurements (4 -stroke diesel engine)
4. I.C. Engines performance test and Exhaust emission measurements (2-stroke petrol engine)
5. Evaluation of engine friction by conducting Morse test on 4-stroke multi cylinder petrol engine.
6. Determination of FP by retardation and motoring test on IC engine.
7. I.C. Engines heat balance at different loads and show the heat distribution curve.
8. Economical speed test of an IC engine.
9. Performance test on variable compression ratio engines.
10. Performance test on reciprocating air compressor unit.
11. Dis-assembly / assembly of different parts of two wheelers. 3 wheelers & 4 wheelers. Tractor & Heavy duty engines covering 2-stroke and 4 stroke, SI and CI engines.
12. Study of boilers, mountings and accessories

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Program Name: Mechanical Faculty Name: A.V.A.R Durga Rao

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	I	Machine Tools Laboratory	R1631037	11/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
33 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

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PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

4. Ability to apply the acquired Mechanical Engineering knowledge to solve engineering problems utilizing advanced technology for the advancement of society and oneself with confidence.
5. Successfully apply the principles of drafting and design, to analyze and evaluate using tools to solve real time problems of structural, thermal and allied field problems resulting in significant societal development.
6. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices and to become responsible citizens with ethical values

Course Objectives:

❖ To understand the parts of various machine tools and operate them. They are required to understand the different shapes of products that can be produced on these machine tools.

Course Outcomes:

❖ Understand the operating principles of different machine tools using different work holders to produce different part features to the desired quality.

LATHE MACHINES:

1. Step turning and taper turning.
2. Thread cutting and knurling.

DRILLING:

1. Drilling and Tapping

SHAPING AND SLOTTING:

1. Shaping operation.
2. Slotting operation.

MILLING:

1. Milling Machine operation

GRINDING:

1. Flat surface grinding operation

Program Name: Mechanical Engineering Faculty Name: A.K.CHAITANYA

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	II	INSTRUMENTATION &CONTROL SYSTEMS	RT32034	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
80 Hours	Theory 5	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.
PSO2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs
PSO3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices

Course Objectives:

- Understand the concept of transducers.
- Recall the various methods of temperature and pressure measurement systems.
- Understand the concept of flow ,velocity , level and vibration measurement systems and various transducers to measure them.
- Discuss the different methods used to measure stress and strain.
- Understand the different techniques used to measure the Humidity, power and torque measurement systems.
- Understand open loop and closed loop control systems and servomechanisms ,able to draw block diagrams for temperature , speed and position control systems.

Course Outcomes:

7. Develop the knowledge of basic principles of measurement.
8. Understand the concepts of Temperature and pressure measurements.
9. Able to understand the working principles of different devices used for the speed, flow and level measurement.
10. Develop the knowledge on Stress-strain measurement.
11. Able to select appropriate device for the measurement of parameters like humidity, torque and power etc.,and justify its use through characteristics and performance.
12. Demonstrate the knowledge on open& closed loop systems.

Course Content

UNIT – I

Definition – Basic principles of measurement – measurement systems, generalized configuration and functional descriptions of measuring instruments – examples. dynamic performance characteristics – sources of error, classification and elimination of error. Measurement of Displacement: Theory and construction of various transducers to measure displacement – piezo electric, inductive, capacitance, resistance, ionization and photo electric transducers, calibration procedures.

UNIT – II

MEASUREMENT OF TEMPERATURE: Classification – ranges – various principles of measurement – expansion, electrical resistance – thermistor – thermocouple – pyrometers – temperature indicators.

MEASUREMENT OF PRESSURE: Units – classification – different principles used. manometers, piston, bourdon pressure gauges, bellows – diaphragm gauges. low pressure measurement – thermal conductivity gauges – ionization pressure gauges, mcleod pressure gauge

UNIT – III

MEASUREMENT OF LEVEL : Direct method – indirect methods – capacitative, ultrasonic, magnetic, cryogenic fuel level indicators – bubler level indicators.

FLOW MEASUREMENT: Rotameter, magnetic, ultrasonic, turbine flow meter, hot – wire anemometer, laser doppler anemometer (LDA).

MEASUREMENT OF SPEED : Mechanical tachometers – electrical tachometers – stroboscope, noncontact type of tachometer Measurement of Acceleration and Vibration: Different simple instruments – principles of seismic instruments – vibrometer and accelerometer using this principle.

UNIT – IV

STRESS STRAIN MEASUREMENTS : Various types of stress and strain measurements – electrical strain gauge – gauge factor – method of usage of resistance strain gauge for bending compressive and tensile strains – usage for measuring torque, strain gauge rosettes.

UNIT – V

MEASUREMENT OF HUMIDITY – Moisture content of gases, sling psychrometer, absorption psychrometer, dew point meter.

MEASUREMENT OF FORCE, TORQUE AND POWER- Elastic force meters, load cells, torsion meters, dynamometers.

UNIT – VI

ELEMENTS OF CONTROL SYSTEMS : Introduction, importance , classification , open and closed systems, servomechanisms,examples with block diagrams–temperature, speed & position control systems.

Textbooks /References (in IEEE format):

Text books:

1. Measurement Systems: Applications & design by D.S Kumar.
2. Mechanical Measurements / BeckWith, Marangoni,Linehard, PHI / PE.

References:

1. Measurement systems: Application and design, Doeblin Earnest. O. Adaptation by Manik and Dhanesh/ TMH.
2. Experimental Methods for Engineers / Holman.
3. Mechanical and Industrial Measurements / R.K. Jain/ Khanna Publishers.
4. Instrumentation, measurement & analysis by B.C.Nakra & K.K.Choudhary, TMH

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Program Name: Mechanical　　　　　　　　　　　　　　　　Faculty Name: A.V.A.R Durga Rao

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	II	Metrology	R1632031	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
81 Hours	Theory 4	Practical	3	Internal 30	External 70	4

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

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PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

7. Ability to apply the acquired Mechanical Engineering knowledge to solve engineering problems utilizing advanced technology for the advancement of society and oneself with confidence.
8. Successfully apply the principles of drafting and design, to analyze and evaluate using tools to solve real time problems of structural, thermal and allied field problems resulting in significant societal development.
9. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices and to become responsible citizens with ethical values.

Course Objectives:

1. Inspection of engineering parts with various precision instruments
2. Design of part, tolerances and fits
3. Principles of measuring instruments and gauges and their uses
4. Evaluation and inspection of surface roughness
5. Inspection of spur gear and thread elements
6. Machine tool testing to evaluate machine tool quality

Course Outcomes:

13. Explain the fundamentals of limits, fits, tolerances and allowances.
14. Identify the uses of gauges and different type of measurement processes.
15. Understand the operation of interferometer and optical measuring instrument systems.
16. Discuss the different surface finish measurements and uses of comparators.
17. Understand the significance of measurement system, errors and transducers intermediate modifying and terminating devices.
18. Explain the working principle of different machine tool alignment tests.

UNIT-I

SYSTEMS OF LIMITS AND FITS: Introduction, nominal size, tolerance, limits, deviations, fits – Unilateral and bilateral tolerance system, hole and shaft basis systems- interchangeability, determistic & statistical tolerances, selective assembly. International standard system of tolerances, selection of limits and tolerances for correct functioning.

UNIT-II

LINEAR MEASUREMENT: Length standards, end standards, slip gauges- calibration of the slip gauges, dial indicators, micrometers.
MEASUREMENT OF ANGLES AND TAPERS:
Different methods – bevel protractor, angle slip gauges- angle dekkor- spirit levels- sine bar- sine table, rollers and spheres used to measure angles and tapers.

LIMIT GAUGES:
Taylor's principle – design of go and no go gauges; plug, ring, snap, gap, taper, profile and position gauges.

UNIT-III

OPTICAL MEASURING INSTRUMENTS: Tools maker's microscope and uses - autocollimators, optical projector, optical flats and their uses.
INTERFEROMETRY:
Interference of light, Michelson's interferometer, NPL flatness interferometer, and NPL gauge interferometer.

UNIT-IV

SURFACE ROUGHNESS MEASUREMENT: Differences between surface roughness and surface waviness – Numerical assessment of surface finish-CLA, Rt., R.M.S. Rz, R10 values, Method of measurement of surface finish – Profilograph, Talysurf, ISI symbols for indication of surface finish.

COMPARATORS: Types - mechanical, optical , electrical and electronic, pneumatic comparators and their uses.

UNIT – V

GEAR MEASUREMENT: Nomenclature of gear tooth, tooth thickness measurement with gear tooth vernier & flange micro meter, pitch measurement, total composite error and tooth to tooth composite errors, rolling gear tester, involute profile checking.
SCREW THREAD MEASUREMENT: Elements of measurement – errors in screw threads- concept of virtual effective diameter, measurement of effective diameter, angle of thread and thread pitch, and profile thread gauges.

UNIT – VI

FLATNESS MEASUREMENT:
Measurement of flatness of surfaces- instruments used- straight edges- surface plates – auto collimator.
MACHINE TOOL ALIGNMENT TESTS: Principles of machine tool alignment testing on lathe, drilling and milling machines.

Program Name: MECH   Faculty Name: E. Rama Krishna Reddy

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	II	Refrigeration & Air Conditioning		11/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
80 Hours	Theory 5	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

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PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs.

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

1. The course is to understand the basic cycles of various refrigerating systems, their performance evaluation along with details of system components and refrigerant properties.
2. The course is also aimed at imparting knowledge of psychrometric properties, processes which are used in air-conditioning systems for comfort and industrial applications.

Course Outcomes:

1. Illustrate the basic concepts of refrigeration system.
2. Analyze the vapour compression cycle and interpret the usage of refrigerants.
3. Explain the components of vapour compression system.
4. Demonstrate the use of psychrometry in analyzing refrigeration systems.
5. Use P-h, T-S and Psychrometric charts to solve refrigeration and Air conditioning
Design problems
6. Discuss the theory and concept of air-conditioning systems

UNIT – I
INTRODUCTION TO REFRIGERATION: Necessity and applications – unit of refrigeration and C.O.P. –Mechanical refrigeration – types of ideal cycles of refrigeration. air refrigeration: bell coleman cycle - open and dense air systems – refrigeration systems used in air crafts and problems.

UNIT – II
VAPOUR COMPRESSION REFRIGERATION: Working principle and essential components of the plant –simple vapour compression refrigeration cycle – COP – representation of cycle on T-S and p-h charts – effect of sub cooling and super heating – cycle analysis – actual cycle influence of various parameters on system performance – use of p-h charts – numerical problems.

UNIT III
REFRIGERANTS – Desirable properties – classification - refrigerants used – nomenclature – ozone depletion –global warming
VCR SYSTEM COMPONENTS: Compressors – general classification – comparison – advantages and disadvantages. condensers – classification – working principles evaporators – classification – working principles expansion devices – types – working principles

UNIT IV

VAPOR ABSORPTION SYSTEM: Calculation of maximum COP – description and working of NH_3 – water system and Li Br –water (Two shell & Four shell) System, principle of operation three fluid absorption system, salient features.

STEAM JET REFRIGERATION SYSTEM: Working Principle and basic components. principle and operation of (i) thermoelectric refrigerator (ii) vortex tube.

UNIT – V

INTRODUCTION TO AIR CONDITIONING: Psychometric properties & processes – characterization of sensible and latent heat loads — need for ventilation, consideration of infiltration – load concepts of RSHF, GSHF- problems, concept of ESHF and ADP temperature. Requirements of human comfort and concept of effective temperature- comfort chart –comfort air conditioning –requirements of industrial air conditioning, air conditioning load calculations.

UNIT – VI

AIR CONDITIONING SYSTEMS: Classification of equipment, cooling, heating humidification and Dehumidification, filters, grills and registers fans and blowers. Heat pump – heat sources – different heat pump circuits.

Program Name: CIVI   Faculty Name: V.G.Priyanka

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	II	Industrial Robotics		19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
65 Hours	Theory 5	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. To introduce fundamental concepts in robotics on manipulators, arm configurations

2.Kinematic and Dynamic applications of Robot.

Course Objectives:

- The students completing this course are expected to understand the concepts of robot dynamics ,kinematics,trajectory planning,and functioning of different types of sensors used in robot,exploring modern and future applications of robot.

Course Outcomes:

1. To introduce fundamental concepts in robotics on manipulators, arm configurations , co-ordinate frames,applications.
2. To familiarize the student with the various components of industrial robotics.
3. To make the students to calculate the forward kinematics and inverse kinematics of serial and parallel robots
4. To make the student learn to calculate the Jacobian for serial and parallel robot
5. To make students learn trajectory planning , software packages for a robotic system.
6. To make students learn and understand the functioning of sensors and actuators. Explore future and modern applications of robotics.

UNIT-I INTRODUCTION:

Automation and Robotics, CAD/CAM and Robotics – An over view of Robotics – present and future applications – classification by coordinate system and control system.

UNIT – II

COMPONENTS OF THE INDUSTRIAL ROBOTICS:

Function line diagram representation of robot arms, common types of arms. Components, Architecture, number of degrees of freedom – Requirements and challenges of end effectors, determination of the end effectors, comparison of Electric, Hydraulic and Pneumatic types of locomotion devices.

UNIT – III

MOTION ANALYSIS: Homogeneous transformations as applicable to rotation and translation –problems.

MANIPULATOR KINEMATICS: Specifications of matrices, D-H notation joint coordinates and world coordinates Forward and inverse kinematics – problems.

UNIT – III

MOTION ANALYSIS: Homogeneous transformations as applicable to rotation and translation – problems. MANIPULATOR KINEMATICS: Specifications of matrices, D-H notation joint coordinates and world coordinates Forward and inverse kinematics – problems.

UNIT – IV

Differential transformation and manipulators, Jacobians – problems Dynamics: Lagrange – Euler and Newton – Euler formulations – Problems.

UNIT V

General considerations in path description and generation. Trajectory planning and avoidance of obstacles, path planning, Skew motion, joint Mechanical Engineering 122 integrated motion –straight line motion – Robot programming, languages and software packages-description of paths with a robot programming language..

UNIT VI

ROBOT ACTUATORS AND FEED BACK COMPONENTS: Actuators: Pneumatic, Hydraulic actuators, electric & stepper motors. Feedback components: position sensors – potentiometers, resolvers, encoders – Velocity sensors.

ROBOT APPLICATIONS IN MANUFACTURING: Material Transfer - Material handling, loading and unloading-Processing - spot and continuous arc welding & spray painting - Assembly and Inspection.

TEXT BOOKS:

1. Industrial Robotics / Groover M P /Pearson Edu.

2. Robotics and Control / Mittal R K & Nagrath I J / TMH.

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Program Name: MECHANICAL-A&B Faculty Name: D.PRASAD

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	II	HEAT TRANSFER	R1632035	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
75 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
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PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

PSO2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs

PSO3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

- The course provides students with fundamental knowledge and Difference of Thermodynamics & Heat transfer
- In this course, the students able to application of Fins and unsteady state heat transfer through metals or bodies
- To demonstrate the fundamentals convection mode of heat transfer.
- To develop knowledge of types of convection heat transfer on different types
- To understand& analyze the heat exchange process in various types
- To apply knowledge of radiation mode of heat transfer & application

Course Outcomes:

- **CO 1:** Explain the fundamental concepts and main ideas of modes Heat Transfer.
- **CO 2:** Demonstrate and analysis of fins and the fundamental concept of transient heat transfer mechanism
- **CO 3:** Fundamental concept of convection mode of heat transfer and dimensional analysis
- **CO 4:** Explain and analysis on different convection mechanisms
- **CO 5:** Demonstrate and analysis of different types of Heat exchangers
- **CO 6:** Explain the fundamental concepts of radiation mode of heat transfer and applications

Syllabus:

- **UNIT – I**

  INTRODUCTION&MODES TO HEAT TRANSFER:

  INTRODUCTION: Modes and mechanisms of heat transfer – basic laws of heat transfer –General discussion about applications of heat transfer.

  CONDUCTION HEAT TRANSFER: Fourier rate equation – general heat conduction equation in Cartesian, cylindrical and Spherical coordinates. Steady, unsteady and periodic heat transfer – initial and boundary conditions. ONE DIMENSIONAL STEADY STATE CONDUCTION HEAT TRANSFER: Homogeneous slabs, hollow cylinders and spheres – overall heat transfer coefficient – electrical analogy – critical radius of insulation- Variable thermal conductivity – systems with heat sources or heat generation.

- **UNIT – II**
  FINS&TRANSIENT HEAT CONDUCTION:
  extended surface (fins) heat Transfer – long fin, fin with insulated tip and short fin, application to error measurement of temperature.
  ONE DIMENSIONAL TRANSIENT CONDUCTION HEAT TRANSFER: Systems with negligible internal resistance – significance of biot and fourier numbers - chart solutions of transient conduction systems.
- **UNIT – III**
  CONVECTIVE HEAT TRANSFER:
  Classification of convective heat transfer – dimensional analysis as a tool for experimental investigation –Buckingham Pi Theorem for forced and free convection, application for
  developing semi – empirical non- dimensional correlation for convective heat transfer – Significance of non-dimensional numbers – concepts of continuity, momentum and Energy Equations.
- UNIT – IV
  FORCED CONVECTION& FREE CONVECTION
  EXTERNAL FLOWS: Concepts about hydrodynamic and thermal boundary layer and use of empirical correlations for convective heat transfer -flat plates and cylinders.
  INTERNAL FLOWS: Concepts about hydrodynamic and thermal entry lengths – division of internal flow based on this –use of empirical relations for horizontal pipe flow and annulus flow.
  FREE CONVECTION: Development of hydrodynamic and thermal boundary layer along a vertical plate – use of empirical relations for vertical plates and pipes.
- UNIT –V
  HEAT TRANSFER WITH PHASE CHANGE
  BOILING: Pool boiling – regimes- calculations on nucleate boiling, critical heat flux and film boiling.
  CONDENSATION: Film wise and drop wise condensation –nusselt's theory of condensation on a vertical plate - film condensation on vertical and horizontal cylinders using empirical correlations.
  HEAT EXCHANGERS:
  Classification of heat exchangers – overall heat transfer coefficient and fouling factor – concepts of LMTD and NTU methods – Problems.
- UNIT - VI
  RADIATION HEAT TRANSFER:
  Emission characteristics and laws of black-body radiation – Irradiation – total and monochromatic quantities – laws of Planck, Wien, Kirchoff, Lambert, Stefan and Boltzmann– heat exchange between two black bodies – concepts of shape factor – Emissivity – heat exchange between grey bodies – radiation shields – electrical analogy for radiation networks.
- TEXT BOOKS:
- TEXT BOOKS:
  1. Heat Transfer - HOLMAN/TMH
  2. Heat Transfer – P.K.Nag/ TMH
  3. Principles of Heat Transfer – Frank Kreith, RM Manglik & MS Bohn, Cengage learning publishers.

  REFERENCE BOOKS:
  1. Heat and Mass Transfer – Arora and Domkundwar, Dhanpatrai & sons.
  2. Fundamentals of Engg. Heat and Mass Transfer / R.C.SACHDEVA / New Age International.
  3. Heat and Mass Transfer –Cengel- McGraw Hill.
  4. Heat and Mass Transfer – D.S.Kumar / S.K.Kataria & Sons.

Program Name: mechanical engineering   Faculty Name: V.Chandrika

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	II	HT LAB		19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
30	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

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PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.
PSO2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs
PSO3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices

Course Objectives:

The laboratory course is aimed to provide the practical exposure to the students with regard to the determination of amount of heat exchange in various modes of heat transfer including condensation & boiling for several geometries

Course Outcomes:

evaluate the amount of heat exchange for plane, cylindrical & spherical geometries and should be able to compare the performance of extended surfaces and heat exchangers

LIST OF EXPERIMENTS

1. COP of VCR System with Capillary and thermal expansion valve.
2. Determination of overall heat transfer co-efficient of a composite slab
3. Determination of heat transfer rate through a lagged pipe.
4. Determination of heat transfer rate through a concentric sphere
5. Determination of thermal conductivity of a metal rod.
6. Determination of efficiency of a pin-fin
7. Determination of heat transfer coefficient in natural and forced convection
8. Determination of effectiveness of parallel and counter flow heat exchangers.
9. Determination of emissivity of a given surface.
10. Determination of Stefan Boltzman constant.
11. Determination of heat transfer rate in drop and film wise condensation.
12. Determination of critical heat flux.
13. Determination of Thermal conductivity of liquids and gases.
14. Investigation of Lambert's cosine law.

Program Name: Mechanical   Faculty Name: A.V.A.R Durga Rao

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	II	Metrology and Instrumentation Laboratory	R1632036	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
39 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

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PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

10. Ability to apply the acquired Mechanical Engineering knowledge to solve engineering problems utilizing advanced technology for the advancement of society and oneself with confidence.
11. Successfully apply the principles of drafting and design, to analyze and evaluate using tools to solve real time problems of structural, thermal and allied field problems resulting in significant societal development.
12. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices and to become responsible citizens with ethical values

Course Objectives:

❖ To Illustrate the use of various measuring devices and gauging instruments for inspection of precision linear, geometric forms, angular and surface finish measurements.

Course Outcomes:

❖ Understand the different instruments that are available for linear, angular, roundness and roughness measurements they will be able to select and use the appropriate measuring instrument according to a specific requirement (in terms of accuracy, etc).

METROLOGY LAB:

1. Measurement of lengths, heights, diameters by vernier calipers, micrometers etc.
2. Measurement of bores by internal micrometers and dial bore indicators.
3. Use of gear tooth vernier caliper for tooth thickness inspection and flange micro meter for checking the chordal thickness of spur gear.
4. Machine tool alignment test on the lathe.
5. Machine tool alignment test on drilling machine.
6. Machine tool alignment test on milling machine.
7. Angle and taper measurements with bevel protractor, Sine bar, rollers and balls.
8. Use of spirit level in finding the straightness of a bed and flatness of a surface.
9. Thread inspection with two wire/ three wire method & tool makers microscope.
10. Surface roughness measurement with roughness measuring instrument.

INSTRUMENTATION LAB

1. Calibration of pressure gauge.
2. Calibration of transducer for temperature measurement.
3. Study and calibration of LVDT transducer for displacement measurement.
4. Calibration of strain gauge.

5. Calibration of thermocouple.
6. Calibration of capacitive transducer.
7. Study and calibration of photo and magnetic speed pickups.
8. Calibration of resistance temperature detector.
9. Study and calibration of a rotameter.
10. Study and use of a seismic pickup for the measurement of vibration amplitude of an engine bed at various loads.
11. Study and calibration of Mcleod gauge for low pressure.

Program Name: MECHANICAL Faculty Name: Ch.Saraswathi

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	I	Unconventional machining process	RT41034	11/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
70 Hours	Theory 12	Practical 6	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

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PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	Ability to apply the acquired Mechanical Engineering knowledge to solve engineering problems utilizing advanced technology for the advancement of society and oneself with confidence.
Selected as the course provides skills required to learn effectively for performing various machining process.	
PSO2	Successfully apply the principles of drafting and design, to analyze and evaluate using tools to solve real time problems of structural, thermal and allied field problems resulting in significant societal development
Selected as the course is used to analyse and solve real time problems.	
PSO3	Develop and implement new ideas by using robotics and mechatronics with the help of modern CAD/CAM tools, while ensuring best manufacturing practices.
Not selected as the course does not related.	

Course Objectives:

- The course aims in identifying the classification of unconventional Machining processes.
- To understand the principle, mechanism of metal removal of various Unconventional machining processes.
- To study the various process parameters and their effect on the Component machined on various unconventional machining processes.
- To understand the applications of different process.

Course Outcomes:

- Explain the importance of unconventional machining process and also discuss ultrasonic Machining process.
- Describe the process of electro chemical machining, electrochemical grinding, and electro chemical honing.
- Discuss briefly thermal metal removal process
- Explain the principle and working of electron beam machining and laser beam machine process.

- Explain the principle & working of plasma arc machining process.
- Explain the working & principle of abrasive jet machining, water jet machining, abrasive water jet machining and also explain mechanism of material removal in various machining process.

UNIT I

INTRODUCTION: Need for non-traditional machining methods classification Of modern machining processes – considerations in process selection, applications.

Ultrasonic machining – Elements of the process, mechanics of material Removal, MRR process parameters, economic considerations, applications and limitations.

UNIT-II

ELECTRO – CHEMICAL MACHINING: Fundamentals of electro Chemical machining, electrochemical grinding, electro chemical honing and Deburring process, metal removal rate in ECM, Tool design, Surface finish And accuracy, economic aspects of ECM – Simple problems for estimation of Metal removal rate, fundamentals of chemical, machining, advantages and Applications.

UNIT-III

THERMAL METAL REMOVAL PROCESSES: General principle and Applications of Electric Discharge Machining, Electric Discharge Grinding And wire EDM – Power circuits for EDM, Mechanics of metal removal in EDM, Process parameters, selection of tool electrode and dielectric fluids, Surface finish and machining accuracy, characteristics of spark eroded Surface.

UNIT-IV

Electron Beam Machining, Laser Beam Machining - Basic principle and Theory, mechanics of material removal, process parameters, efficiency & Accuracy, applications

UNIT-V

Plasma Machining: Application of plasma for machining, metal removal Mechanism, process parameters, accuracy and surface finish and other Applications of plasma in manufacturing industries.

UNIT-VI

Abrasive jet machining, Water jet machining and abrasive water jet Machining: Basic principles, equipments, process variables, mechanics of Material removal, MRR, application and limitations. Magnetic abrasive finishing, abrasive flow finishing, Electro stream drilling, Shaped tube electrolytic machining.

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Program Name: MECHANCIAL Faculty Name: K.Girish Kumar

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	I	Automobile Engineering	RT41031	18/6/18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
80 Hours	Theory 5	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

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PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyses and solve the problems in the domains of design, thermal and allied fields.

2 Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs**.**

3 Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

❖ The course imparts the principles of automobile systems and provides the salient features of safety, emission and service of automobiles.

Course Outcomes:

1. Classify basic components of an automobile.
2. Select transmission system for a given vehicle.
3. Summarize steering systems used in automobile.
4. Understand braking and suspension systems.
5. Describe the safety systems employed in a automobile.
6. Understand engine service and emission control.

Course Content

UNIT – I

INTRODUCTION: Components of four wheeler automobile – chassis and body – power unit – power transmission – rear wheel drive, front wheel drive, 4 wheel drive – types of automobile engines, engine construction, turbo charging and super charging – engine lubrication, splash and pressure lubrication systems, oil filters, oil pumps – crank case ventilation – engine service, reboring, decarbonisation, Nitriding of crank shaft.

UNIT – II

TRANSMISSION SYSTEM: Clutches, principle, types, cone clutch, single plate clutch, multi plate clutch, magnetic and centrifugal clutches, fluid fly wheel – gear boxes, types, sliding mesh, construct mesh, synchro mesh gear boxes, epicyclic gear box, over drive torque converter. propeller shaft – Hotch – Kiss drive, Torque tube drive, universal joint, differential rear axles – types – wheels and tyres.

UNIT – III

STEERING SYSTEM: Steering geometry – camber, castor, king pin rake, combined angle toein, center point steering. types of steering mechanism – Ackerman steering mechanism, Davis steering mechanism, steering gears –

types, steering linkages.
UNIT – IV
SUSPENSION SYSTEM: Objects of suspension systems – rigid axle suspension system, torsion bar, shock absorber, Independent suspensionsystem.
BRAKING SYSTEM: Mechanical brake system, hydraulic brake system, master cylinder, wheel cylinder tandem master cylinder requirement of brake fluid, pneumatic and vacuum brakes.
ELECTRICAL SYSTEM: Charging circuit, generator, current – voltage regulator – starting system, bendix drive mechanism solenoid switch, lighting Mechanical Engineering 140systems, horn, wiper, fuel gauge – oil pressure gauge, engine temperatureindicator etc.
UNIT – V
ENGINE SPECIFICATION AND SAFETY SYSTEMS: Introductionengine specifications with regard to power, speed, torque, no. of cylindersand arrangement, lubrication and cooling etc.Safety: Introduction, safety systems - seat belt, air bags, bumper, anti lockbrake system (ABS), wind shield, suspension sensors, traction control,mirrors, central locking and electric windows, speed control.
UNIT – VI
ENGINE EMISSION CONTROL: Introduction – types of pollutants,mechanism of formation, concentration measurement, methods of controlling-engine modification, exhaust gas treatment-thermal and catalyticconverters-use of alternative fuels for emission control – National and International pollution standards.
ENGINE SERVICE: Introduction, service details of engine cylinder head, valves and valve mechanism, piston-connecting rod assembly, cylinder block, crank shaft and main bearings, engine reassembly-precautions.
TEXT BOOKS:
1. Automotive Mechanics – Vol. 1 & Vol. 2 / Kripal Sing, standard publishers.
2. Automobile Engineering / William Crouse, TMH Distributors .
3. Automobile Engineering- P.S Gill, S.K. Kataria & Sons, New Delhi.
REFERENCES:
1. Automotive Engines Theory and Servicing, James D. Halderman and Chase D. Mitchell Jr., Pearson education inc.
2. Automotive Engineering / Newton Steeds & Garrett.
3. Automotive Mechanics / Heitner.

Program Name: Mechanical Engineering Faculty Name: D KISHORE BABU

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	I	FINITE ELEMENT METHODS	RT41033	10/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
80 Hours	5		3	30	70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.
PSO2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs
PSO3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices

Course Learning Objectives:

- To learn basic principles of finite element analysis procedure .
- To learn the theory and characteristics of finite elements that represent engineering structures.
- To learn and apply finite element solutions to structural, thermal, dynamic problem to develop the knowledge and skills needed to effectively evaluate finite element analyses performed by others.
- Learn to model complex geometry problems and solution techniques.

Course Outcomes:

1. Understand the concepts behind variational methods and weighted residual methods in FEM.
2. Understand the Discretization procedures, element shapes node numbering schemes, assembly of stiffness matrix in FEM and treatments of boundary conditions
3. Identify the application and characteristics of FEA elements such as trusses, beams.
4. Analysis of constant strain triangles and formulation of axis symmetric problems.
5. Apply finite element analysis to higher order and isoparametric elements.
6. Able to identify how the finite element method expands beyond the structural domain, for problems involving dynamics, heat transfer, and evaluation of eigen values and eigen vectors.

Course Content

UNIT-I

Introduction to finite element method, stress and equilibrium, strain – displacement relations, stress – strain relations, plane stress and plane strain conditions, variational and weighted residual methods, concept of potential energy, one dimensional problems.

UNIT – II

Discretization of domain, element shapes, discretization procedures, assembly of stiffness matrix, band width, node numbering, mesh generation, interpolation functions, local and global coordinates, convergence requirements, treatment of boundary conditions.

UNIT – III

Analysis of Trusses: Finite element modeling, coordinates and shape functions, assembly of global stiffness matrix and load vector, finite element equations, treatment of boundary conditions, stress, strain and support reaction calculations. Analysis of Beams: Element stiffness matrix for Hermite beam element, derivation of load vector for concentrated and UDL, simple problems on beams.

UNIT – IV

Finite element modeling of two dimensional stress analysis with constant strain triangles and treatment of boundary conditions, formulation of axis symmetric problems.

UNIT-V

Higher order and isoparametric elements: One dimensional quadratic and cubic Mechanical Engineering 144 elements in natural coordinates, two dimensional four noded isoparametric elements and numerical integration.

UNIT – VI

Steady state heat transfer analysis : one dimensional analysis of a fin and two dimensional analysis of thin plate, analysis of a uniform shaft subjected to torsion. Dynamic Analysis: Formulation of finite element model, element consistent and lumped mass matrices, evaluation of eigen values and eigen vectors, free vibration analysis.

TEXT BOOKS:

1. Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu / Prentice – Hall.

2. The Finite Element Methods in Engineering / SS Rao / Pergamon.

REFERENCES:

1. Finite Element Method with applications in Engineering / YM Desai, Eldho & Shah /Pearson publishers.
2. An introduction to Finite Element Method / JN Reddy / McGrawHill.
3. The Finite Element Method for Engineers – Kenneth H. Huebner, Donald L. Dewhirst, Douglas E. Smith and Ted G. Byrom / John Wiley & sons (ASIA) Pte Ltd.
4. Finite Element Analysis: Theory and Application with Ansys, Saeed Moaveniu, Pearson Education.

Program Name: MECH Faculty Name: E. Rama Krishna Reddy

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	I	Design for manufacture	RT41038	11/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
80 Hours	Theory 5	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs.

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

1. Understand the design rules and considerations with reference to various manufacturing processes.
2. To discusses capabilities and limitations of each manufacturing process in relation to part design and cost.
3. To examine DFM principles including how the design affects manufacturing cost, lean manufacturing, six sigma, etc.

Course Outcomes:

1. Understand the design rules for manufacturability and principles of design for economic production.
2. Design components for different machining operations.
3. Casting design and choose the best casting process for a specific product.
4. Evaluate the effect of thermal stresses in weld joints.
5. Design components for sheet metal work by understanding in depth the sheet metal processes and their formation mechanisms.
6. Design of plastic components for machining, joining and selection of proper processing for different joining cases.

UNIT - I

Introduction: Design philosophy-steps in design process-general design rules for manufacturability-basic principles of designing for economical production - creativity in design.

UNIT - II

Machining processes: Overview of various machining processes-general design rules for machining-dimensional tolerance and surface roughness- Design for machining – ease –redesigning of components for machining ease with suitable examples. General design recommendations for machined parts.

UNIT - III

Metal casting: Appraisal of various casting processes, selection of casting process,-general design considerations for casting-casting tolerance-use of solidification, simulation in casting design-product design rules for sand casting.

UNIT - IV

Metal joining: Appraisal of various welding processes, factors in design of weldments – general design guidelines-pre and post treatment of weldseffects of thermal stresses in weld joints-design of brazed joints. Forging: Design factors for forging – closed die forging design – parting lines of dies –drop forging die design – general design recommendations.

UNIT – V

Extrusion & Sheet metal work: Design guide lines extruded sectionsdesign principles for punching, blanking, bending, deep drawing-Keeler Goodman forging line diagram – component design for blanking.

UNIT – VI

Plastics: Visco elastic and creep behavior in plastics-design guidelines for plastic components-design considerations for injection moulding – design guidelines for machining and joining of plastics.

Program Name: MECH Faculty Name: T. Lakshmi Devi

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	I	Nano Technology	RT41036	11/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
78 Hours	Theory 5	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.

2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs.

3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Outcomes:

1. Understand the basic concepts of nano technology &crystal structure.
2. Understand the properties of nano particles and electronic structure .Effect of size on properties on nano materials.
3. Applying the principles of nono technology in the preparation of nano structures.
4. Understand the different characterization techniques of various instruments.
5. Understand the characterization of carbon allotropes and their applications.
6. Applying the principles of nano technology for medicine, surface science, material science.

Course objective:

On successful completion of the course, students should be able to:
Understand the basic cientific concepts of nanoscience. Understand the properties of nano materials, characterization of materials, synthesis and fabrication. Understand the applications of nano technology in various science, engineering and technology fields.

<u>SYLLABUS:</u>

UNIT-I

INTRODUCTION: History of nano science, definition of nano meter, nano materials, nano technology. Classification of nano materials. Crystal symmetries, crystal directions, crystal planes. Band structure.

UNIT-II

PROPERTIES OF MATERIALS:

Mechanical properties, electrical properties, dielectric properties, thermal properties, magnetic properties, opto electronic properties. Effect of size reduction on properties, electronic structure of nano materials.

UNIT-III

SYNTHESIS AND FABRICATION: Synthesis of bulk polycrystalline samples, growth of single crystals. Synthesis techniques for preparation of nano particle – Bottom Up Approach – sol gel synthesis, hydro thermal growth, thin film growth, PVD and CVD; Top Down Approach – Ball milling, micro fabrication, lithography. Requirements for realizing semiconductor nano structures, growth techniques for nano structures.

UNIT-IV

CHARECTERIZATION TECHNIQUES: X-Ray diffraction and Scherrer method, scanning electron microscopy, transmission electron microscopy, scanning probe microscopy, atomic force microscopy, piezoresponse microscopy, X-ray photoelectron spectroscopy, XANES and XAFS, angle resolved photoemission spectroscopy, diffuse reflectance spectra, photoluminescence spectra, Raman spectroscopy.

UNIT-V

CARBON NANO TECHNOLOGY:

Characterization of carbon allotropes, synthesis of diamond – nucleation of diamond, growth and morphology. Applications of nano crystalling diamondfilms, grapheme, applications of carbon nano tubes.

UNIT-VI

APPLICATIONS OF NANO TECHNOLOGY:

Applications in material science, biology and medicine, surface science, energy and environment. Applications of nano structured thin fins, applications of quantum dots.

TEXT BOOKS:

1. Nano science and nano technology by M.S Ramachandra Rao, Shubra Singh, Wiley publishers.

REFERENCE BOOKS:

1. Introduction to Nano Technology by Charles P. Poole, Jr., Frank J.Owens, Wiley publishers.
2. Nanotechnology by Jermy J Ramsden, Elsevier publishers.
3. Nano Materials- A.K.Bandyopadhyay/ New Age Introdu.
4. Nano Essentials- T.Pradeep/TMH.
5. Nanotechnology the Science of Small by M.A Shah, K.A Shah, Wiley Publishers.

7. Principles of Nanotechnology by Phani Kumar, Scitech.

Program Name: Mechanical Faculty Name: D.KishoreBabu/K.Girish Kumar

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	I	**SIMULATION LAB**	**RT4103L**	19/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
39 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

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PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

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PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

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PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to apply the acquired Mechanical Engineering knowledge to solve engineering problems utilizing advanced technology for the advancement of society and oneself with confidence.
2. Successfully apply the principles of drafting and design, to analyze and evaluate using tools to solve real time problems of structural, thermal and allied field problems resulting in significant societal development.
3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices and to become responsible citizens with ethical values

Course Objectives:

1. To impart the fundamental knowledge on using various analytical tools like ANSYS, FLUENT, etc., for Engineering Simulation.
2. To know various fields of engineering where these tools can be effectively used to improve the output of a product.
3. To impart knowledge on how these tools are ued in Industries by solving some real time problems using these tools..

Course Outcomes:

CO1: Create CAD models using modeling software.

CO2: Analyse structural engineering problems using ANSYS software.

CO3 Create parts on CNC lathe / CNC X Mill.

SYLLABUS:

1. DRAFTING : Development of part drawings for various components in the form of orthographic andisometric. representation of dimensioning and tolerances scanning and plotting. study of script, DXE and IGES files.

2. PART MODELING : Generation of various 3D models through

protrusion, revolve, shell sweep. creation of various features. study of parent child relation. feature based and boolean based modeling surface and assembly modeling. study of various standard translators. design simple components.

3. a) Determination of deflection and stresses in 2D and 3D trusses and beams.

b) Determination of deflections component and principal and Von-mises stresses in plane stress, plane strain and Axisymmetric components.

c) Determination of stresses in 3D and shell structures (at least one example in each case)

d) Estimation of natural frequencies and mode shapes, Harmonic response of 2D beam.

e) Steady state heat transfer Analysis of plane and Axisymmetric components.

4. a) Development of process sheets for various components based on tooling Machines.

b) Development of manufacturing and tool management systems.

c) Study of various post processors used in NC Machines.

d) Development of NC code for free form and sculptured surfaces using CAM packages.

e) Machining of simple components on NC lathe and Mill by transferring NC Code / from a CAM package. Through RS 232.

f) Quality Control and inspection.

Packages to be provided to cater to drafting, modeling & analysis from the following:

Auto CAD, Micro Station, CATIA, Pro-E, I-DEAS, ANSYS, NISA, CAEFEM, Gibbs CAM, Master CAM etc.

Program Name: MECHANCIAL Faculty Name: K.Girish Kumar

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	II	Green Engineering Systems	RT42032	19/11/18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
80 Hours	Theory 5	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

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PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to analyses and solve the problems in the domains of design, thermal and allied fields.

2 Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs **.**

3 Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Context and Overview:

The course aims to highlight the significance of alternative sources of energy, Green energy systems and processes and provides the theory and working Principles of probable sources of renewable and green energy systems that are environmental friendly.

Course Outcomes:

1. Implement solar photovoltaic cell application using various operating parameters.
2. Classify solar energy storage & describe wind energy potential.
3. Describe various unconventional energy sources like biomass, geothermal& OTEC and their importance in current scenario.
4. Select energy efficient electrical & mechanical system based upon end application.
5. Summarizing energy efficient process of various manufacturing & production systems.
6. Select various green materials for energy management of green buildings.

Course Content

UNIT-I
INTRODUCTION:
SOLAR RADIATION: Role and potential of new and renewable sources, the solar energy option, Environmental impact of solar power, structure of the sun, the solar constant, sun-earth relationships, coordinate systems and coordinates of the sun, extraterrestrial and terrestrial solar radiation, solar radiation on titled surface, instruments for measuring solar radiation and sun shine, solar radiation data, numerical problems. Photo voltaic energy conversion – types of PV cells, I-V characteristics.
SOLAR ENERGY COLLECTION: Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors.

UNIT – II

SOLAR ENERGY STORAGE AND APPLICATIONS: Different methods,

sensible, latent heat and stratified storage, solar ponds, solar applications- solar heating/cooling technique, solar distillation and drying, solar cookers, central power tower concept and solar chimney.

WIND ENERGY: Sources and potentials, horizontal and vertical axis windmills, performance characteristics, betz criteria, types of winds, wind data measurement.

UNIT – III

BIO-MASS: Principles of bio-conversion, anaerobic/aerobic digestion, types of bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, bio fuels, I.C. engine operation and economic aspects.

GEOTHERMAL ENERGY: Resources, types of wells, methods of harnessing the energy, potential in India.

OCEAN ENERGY: OTEC, Principles of utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics.

UNIT –IV

ENERGY EFFICIENT SYSTEMS:

(A) ELECTRICAL SYSTEMS: Energy efficient motors, energy efficient lighting and control, selection of luminaire, variable voltage variable frequency drives (adjustable speed drives), controls for HVAC (heating, ventilation and air conditioning), demand site management.

(B) MECHANICAL SYSTEMS: Fuel cells- principle, thermodynamic aspects, selection of fuels & working of various types of fuel cells, Environmental friendly and Energy efficient compressors and pumps**.**

UNIT-V

ENERGY EFFICIENT PROCESSES: Environmental impact of the current manufacturing practices and systems, benefits of green manufacturing systems, selection of recyclable and environment friendly materials in manufacturing, design and implementation of efficient and sustainable green production systems with examples like environmental friendly machining, vegetable based cutting fluids, alternate casting and joining techniques, zero waste manufacturing.

UNIT – VI

GREEN BUILDINGS: Definition, features and benefits. Sustainable site selection and planning of buildings for maximum comfort. Environmental friendly building materials like bamboo, timber, rammed earth, hollow blocks, lime & lime pozzolana cement, agro materials and industrial waste, Ferro cement and Ferro-concrete, alternate roofing systems, paints to reduce heat gain of the buildings. Energy management.

TEXT BOOKS:

1. Sukhatme S.P. and J.K.Nayak, *Solar Energy – Principles of Thermal Collection and Storage*, TMH.
2. Khan B.H., Non-Conventional Energy Resources, Tata McGraw Hill, New Delhi, 2006.
3. Green Manufacturing Processes and Systems, Edited by J. Paulo Davim, Springer 2013.

REFERENCES:

1. Alternative Building Materials and Technologies / K.S Jagadeesh, B.V Venkata Rama Reddy and K.S Nanjunda Ra. 2. Principles of Solar Energy / Frank Krieth & John F Kreider.

3. Non-Conventional Energy / Ashok V Desai /Wiley Eastern.
4. Renewable Energy Technologies /Ramesh & Kumar /Narosa
5. Renewable Energy Technologies/ G.D Roy

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO
COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: MECHANICAL-A&B   Faculty Name: N.V. Malavika

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	II	Non Destructive Evaluation	R1342034A	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
73 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.
PSO2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs
PSO3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

- ❖ The students are to be exposed to the concepts of various NDE techniques using radiography, ultrasonics, liquid penetrates, magnetic patches and Eddy currents.
- ❖ They will learn basic principles of these methods and will be able to select a testing process.
- ❖ They will understand the advantages and disadvantages of these techniques.

Course Outcomes:

19. Describe the historical and industrial scope of NDT by Radiographic Testing (RT) technique.
20. Understand the basic principle and equipments used for Ultrasonic Testing.
21. Understand the basic principle and equipments used for Liquid Penetrant Test.
22. Understand the basic principle, equipments, effectiveness, limitations and applications used for Magnetic Particle Test.
23. Understand the basic principle, equipments, effectiveness, limitations and applications used for Eddy Current Test.
24. Understand the different Industrial Applications of NDE.

UNIT – I
Introduction to non-destructive testing: Radiographic test, Sources of X and Gamma Rays and their interaction with Matter, Radiographic equipment, Radiographic Techniques, Safety Aspects of Industrial Radiography

UNIT – II
Ultrasonics test: Principle of Wave Propagation, Reflection, Refraction, Diffraction, Mode Conversion and Attenuation, Sound Field, Piezo-electric Effect, Ultrasonic Transducers and their Characteristics, Ultrasonic Equipment and Variables Affecting Ultrasonic Test, Ultrasonic Testing, Interpretations and Guidelines for Acceptance, Rejection - Effectiveness and Limitations of Ultrasonic Testing.

UNIT – III

Liquid Penetrant Test: Liquid Penetrant Test, Basic Concepts, Liquid Penetrant System, Test Procedure, Effectiveness and Limitations of Liquid Penetrant Testing

UNIT – IV

Magnetic Particle Test: Magnetic Materials, Magnetization of Materials , Demagnetization of Materials,Principle of Magnetic Particle Test, Magnetic Particle Test Equipment, Magnetic Particle Test Procedure, Standardization and Calibration, Interpretation and Evaluation, Effective Applications and Limitations of the Magnetic Particle Test.

UNIT – V

Eddy Current Test: Principle of Eddy Current, Eddy Current Test System, Applications of Eddy Current Testing Effectiveness of Eddy Current Testing

UNIT – VI

Industrial Applications of NDE: Span of NDE Activities Railways, Nuclear, Non-nuclear and Chemical Industries, Aircraft and Aerospace Industries, Automotive Industries, Offshore Gas and Petroleum Projects, Coal Mining Industry, NDE of pressure vessels, castings, welded constructions.

TEXT BOOKS:

1. Non-destructive test and evaluation of Materials, J Prasad, GCK Nair, TMH Publishers.
2. Ultrasonic testing by Krautkramer and Krautkramer.
3. Non-destructive testing, Warress, JMcGonmade.

REFERENCES:

1. Ultrasonic inspection training for NDT: E. A. Gingel, Prometheus Press.
2. ASTM Standards, Vol 3.01, Metals and alloys.
3. Non-destructive, Hand Book – R. Hamchand .

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Program Name: MECHANICAL Faculty Name:Ch.Saraswathi

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	II	Production Planning and Control	RT42031	11/6/2018

SYLLABUS

<table>
<tr><td>Total No.of Hours for Teaching-Learning</td><td colspan="2">Instructional Hours for Week</td><td>Duration of semester End Examination in Hours</td><td colspan="2">Max Marks</td><td>Credits</td></tr>
<tr><td>70 Hours</td><td>Theory
12</td><td>Practical
6</td><td>3</td><td>Internal
30</td><td>External
70</td><td>3</td></tr>
</table>

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1	Ability to analyze and solve the problems in the domains of design, thermal and allied fields.
PSO2	Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs
	Not selected as the course does not address any aspects.
PSO3	Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.

Course Objectives:

This subject provides students with
1. An understanding of the concepts of production and service systems
2. The ability to apply principles and techniques in the design, planning and control of these systems to optimise/make best use of resources in achieving their objectives.
3. Identify different strategies employed in manufacturing and service industries to plan production and control inventory.
4. Measure the effectiveness, identify likely areas for improvement, develop and implement improved planning and control methods for production systems.

Course Outcomes:

1.Explain the concept of production & services system.

2.Describe the forecasting & apply the suitable techniques for estimating the forecasting

3.Discuss the inventory management & apply the suitable techniques to control the inventory

4. Explain different strategies (Routing& Scheduling) to plan the production.

5.Discuss the overview of dispatching

UNIT – I
Introduction: Definition – objectives and functions of production planning and control – elements of production control – types of production – organization of production planning and control department – internal organization of department.

UNIT – II
Forecasting – importance of forecasting – types of forecasting, their uses – general principles of forecasting – forecasting techniques – qualitative methods and quantitive methods.

UNIT – III
Inventory management – functions of inventories – relevant inventory costs – ABC analysis – VED analysis – EOQ model – Inventory control systems – P–Systems and Q-Systems. Introduction to MRP I, MRP II, ERP, LOB (Line of Balance), JIT and KANBAN system.

UNIT – IV
Routing – definition – routing procedure –route sheets – bill of material – factors affecting routing procedure, schedule –definition – difference with loading.

UNIT – V
Scheduling policies – techniques, standard scheduling methods. Line Balancing, aggregate planning, chase planning, expediting, controlling aspects.

UNIT – VI
Dispatching – activities of dispatcher – dispatching procedure – follow up – definition – reason for existence of functions – types of follow up,applications of computer in production planning and control.

Program Name: mechanical engineering Faculty Name: V.Chandrika

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	II	POWER PLANT ENGINEERING	RT42033D	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
80 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

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PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1. Ability to analyse and solve the problems in the domains of design, thermal and allied fields.
PSO2. Develop and implement new ideas with the help of simulation tools which addresses societal and industrial needs
PSO3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices

Course Objectives:

The course is aimed at providing knowledge of power generation through different prime movers viz steam, ICGT, Hydro, nuclear and hybrid systems along with their economics and environmental considerations.

Course Outcomes:

CO 1: Understand the working of different circuits (or components) of steam power plant and their construction.

CO 2: Understand the working of components of diesel engine power plant and of different gas turbine power plants.

CO 3: Understand and study the hydrographs, construction of different types of dams and spillways.

CO 4: Study and understand the different nuclear reactors of nuclear power plant.

CO5: Study and understand the combined operation of different power plants and instrumentation of powerplant

CO 6: Evaluate the power plant economics and study the environmental consideration due to pollutants emitted by power plant and their control.

UNIT – I

Introduction to the sources of energy – resources and development of power in india.

STEAM POWER PLANT: Plant layout, working of differentcircuits, fuelandhandlingequipments, types of coals, coal handling, choice of handlingequipment, coal storage, ash handling systems. Combustion: properties ofcoal – overfeed and underfeed fuel beds, traveling grate stokers, spreader stokers, retort stokers, pulverized fuel burning system and its components, combustion needs and draught system, cyclone furnace, design and construction, dust collectors, cooling towers and heat rejection. corrosion and feed water treatment.

UNIT – II

INTERNAL COMBUSTION AND GAS TURBINE POWER PLANTS:

DIESEL POWER PLANT: Plant layout with auxiliaries – fuel supply system, air starting equipment, super charging.

GAS TURBINE PLANT: Introduction – classification - construction –layout with auxiliaries, combined cycle power plants and comparison.

UNIT – III

HYDRO ELECTRIC POWER PLANT: Water power – hydrological cycle/ flow measurement – drainage area characteristics – hydrographs – storage and pondage – classification of dams and spill ways.

HYDRO PROJECTS AND PLANT: Classification – typical layouts –plant auxiliaries – plant operation pumped storage plants.

UNIT – IV

NUCLEAR POWER STATION: Nuclear fuel – breeding and fertilematerials – nuclear reactor – reactor operation.

TYPES OF REACTORS: Pressurized water reactor, boiling water reactor,sodium-graphite reactor, fast breeder reactor, homogeneous reactor, gascooled reactor, radiation hazards and shielding – radioactive waste disposal.

UNIT – V

COMBINED OPERATIONS OF DIFFERENT POWER PLANTS: Introduction, advantages of combined working, load division between powerstations, storage type hydro-electric plant in combination with steam plant,run-of-river plant in combination with steam plant, pump storage plant in combination with steam or nuclear power plant, co-ordination of hydroelectricand gas turbine stations, co-ordination of hydro-electric and nuclear power stations, co-ordination of different types of power plants.

POWER PLANT INSTRUMENTATION AND CONTROL: Importance of measurement andinstrumentation in power plant, measurement of waterpurity, gas analysis, O2 and CO2 measurements, measurement of smoke anddust, measurement of moisture in carbon dioxide circuit, nuclearmeasurements.

UNIT – VI

POWER PLANT ECONOMICS AND ENVIRONMENTAL CONSIDERATIONS: Capital cost, investment of fixed charges, operatingcosts, general arrangement of power distribution, load curves, load durationcurve, definitions of connected load, maximum demand, demand factor,average load, load factor, diversity factor – related exercises. effluents from power plants and Impact on environment – pollutants and pollution standards– methods of pollution control.

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Program Name: Mechanical Faculty Name: D.KishoreBabu

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	I	**COMPUTATIONAL FLUID DYNAMICS LAB**	**RT410 3L**	19/06/2018

SYLLABUS

<table>
<tr><td>Total No.of Hours for Teaching-Learning</td><td colspan="2">Instructional Hours for Week</td><td>Duration of semester End Examination in Hours</td><td colspan="2">Max Marks</td><td>Credits</td></tr>
<tr><td>39 Hours</td><td>Theory</td><td>Practical 3</td><td>3</td><td>Internal 25</td><td>External 50</td><td>2</td></tr>
</table>

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

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PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Ability to apply the acquired Mechanical Engineering knowledge to solve engineering problems utilizing advanced technology for the advancement of society and oneself with confidence.
2. Successfully apply the principles of drafting and design, to analyze and evaluate using tools to solve real time problems of structural, thermal and allied field problems resulting in significant societal development.
3. Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices and to become responsible citizens with ethical values

Course Objectives:

• Solving Problems of fluid mechanics and heat transfer by writing programs in C-language and MATLAB.

• Using ANSYS-FLUENT build a geometry, mesh that geometry, Perform CFD method on the mesh, perform the calculation, and post-process the results.

• Understanding the validation of the numerical result by comparison with known analytical results.

• Understanding the numerical result by invoking the physical principles of fluid mechanics and heat transfer.

Course Outcomes:

CO1: Create CAD models using modeling software.

CO2: Analyse structural engineering problems using ANSYS software.

CO3 Create parts on CNC lathe / CNC X Mill.

SYLLABUS:

PART-A
Writing Programs in C and MATLAB for the following:
1. Solution of Transcendental equations
2. Solution of Simultaneous algebraic equations
3. Numerical differentiation and Integration
4. Solution of Ordinary Differential Equation
5. Solution of a Tri-diagonal matrix using Thomas Algorithm.
6. Solution of Partial differential equations related to
i) Elliptical Partial differential equations
ii) Parabolic Partial differential equations

iii) Hyperbolic Partial differential equations
7. Solution of 1-D and 2-D heat conduction with (Finite Difference method)
i) Constant temperature boundary conditions
ii) Constant heat flux boundary conditions
iii) Convective boundary conditions
8. Solution of Incompressible Navier-Stokes equations (Finite difference and Finite Volume methods)
9. Solution of Inviscid incompressible fluid flows.(Finite difference and Finite Volume methods)
PART-B
Using ANSYS-FLUENT solve the following problems of heat transfer analysis
1. steady state conduction
2. Lumped heat transfer
3. Convective heat transfer – Internal flow (study both velocity and thermal boundary layers)
4. Convective heat transfer – External flow (study both velocity and thermal boundary layers)
5. Radiation heat transfer– Emissivity

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Program Name: B.TECH Faculty Name: K.LAKSHMI GANESH

Class	Semester	Title of The Paper	Paper Code	W.E.F
II YEAR	I	Electrical circuit analysis-II	R1621021	11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical ---	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:**

   Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:**

   Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**:

   Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**:

    Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**:

    Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**:

    Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To study the concepts of balanced and unbalanced three-phase circuits.
2. To study the transient behaviour of electrical networks with DC, pulse and AC excitations.
3. To study the performance of a network based on input and output excitation/response.
4. To understand the realization of electrical network function into electrical equivalent passive elements.
5. To understand the application of fourier series and fourier transforms for analysis of electrical circuits.

Course Outcomes:

1. Identify and analyze three phase balanced circuits and their interconnections.
2. Identify and analyze three phase unbalanced circuits and their interconnections.
3. Analysis of the dynamic behavior of electrical DC & AC circuits using differential equations

   and Laplace transforms.
4. Students are able to find parameters for different types of network.
5. Students are able to realize electrical equivalent network for a given network transfer function
6. Students are able to extract different harmonics components from the response of a electrical network

UNIT-I Balanced Three phase circuits

Phase sequence- star and delta connection - relation between line and phase voltages and currents - analysis of balanced three phase circuits - measurement of active and reactive power.

UNIT-II Unbalanced Three phase circuits

Analysis of three phase unbalanced circuits: Loop method – Star-Delta transformation technique, Two wattmeter methods for measurement of three phase power.

UNIT-III Transient Analysis in DC and AC circuits

Transient response of R-L, R-C, R-L-C circuits for DC and AC excitations, Solution using differential equations and Laplace transforms.

UNIT-IV Two Port Networks

Two port network parameters – Z, Y, ABCD and Hybrid parameters and their relations, Cascaded networks - Poles and zeros of network functions.

UNIT-V Network synthesis

Positive real function - basic synthesis procedure - LC immittance functions - RC impedance functions and RL admittance function - RL impedance function and RC admittance function - Foster and Cauer methods.

UNIT-VI Fourier analysis and Transforms

Fourier theorem- Trigonometric form and exponential form of Fourier series, Conditions of symmetry-line spectra and phase angle spectra, Analysis of electrical circuits to non sinusoidal periodic waveforms. Fourier integrals and Fourier transforms – properties of Fourier transforms physical significance of the Fourier Transform and its application to electrical circuits.

Program Name: B.TECH Faculty Name: Y.Rajendra Babu

Class	Semester	Title of The Paper	Paper Code	W.E.F
II YEAR	I	Electrical Machines-I		11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical ---	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:**

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:**

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Learning objectives:

- Understand the unifying principles of electromagnetic energy conversion.
- Understand the construction, principle of operation and performance of DC machines.
- Learn the characteristics, performance,methods of speed control and testing methods of DC motors.
- To predetermine the performance of single phase transformers with equivalent circuit models.
- Understand the methods of testing of single-phase transformer.
- Analyze the three phase transformers and achieve three phase to two phase conversion.

Course Outcomes:

1. Able to assimilate the concepts of electromechanical energy conversion.
2. Able to mitigate the ill-effects of armature reaction and improve commutation in dc machines.
3. Able to understand the torque production mechanism and control the speed of dc motors.
4. Able to analyze the performance of single phase transformers.
5. Able to predetermine regulation, losses and efficiency of single phase transformers.
6. Able to parallel transformers, control voltages with tap changing methods and achieve three-phase to two-phase transformation.

UNIT–I:
Electromechanical Energy Conversion and introduction to DC machines
Principles of electromechanical energy conversion – singly excited and multi excited system – Calculation of force and torque using the concept of co-energy. Construction and principle of operation of DC machine – EMF equation for generator – Classification of DC machines based on excitation – OCC of DC shunt generator.

UNIT–II:
Performance of D.C. Machines
Torque and back-emf equations of dc motors– Armature reaction and commutation – characteristics of separately-excited, shunt, series and compound motors - losses and efficiency- applications of dc motors.

UNIT-III:
Starting, Speed Control and Testing of D.C. Machines
Necessity of starter – Starting by 3 point and 4 point starters – Speed control by armature voltage and field control – testing of DC machines - brake test, Swinburne's method – principle of regenerative or Hopkinson's method - retardation test -- separation of losses.

UNIT–IV:
Single-phase Transformers
Types and constructional details - principle of operation - emf equation - operation on no load and on load – lagging, leading and unity power factors loads - phasor diagrams of transformers – equivalent circuit – regulation – losses and efficiency – effect of variation of frequency and supply voltage on losses – All day efficiency.

UNIT-V
Single-phase Transformers Testing

Tests on single phase transformers – open circuit and short circuit tests – Sumpner's test – separation of losses – parallel operation with equal voltage ratios – auto transformer - equivalent circuit – comparison with two winding transformers.

UNIT-VI

3-Phase Transformers

Polyphase connections - Y/Y, Y/Δ, Δ/Y, Δ/Δ and open Δ -- Third harmonics in phase voltages - three winding transformers: determination of Zp, Zs and Zt -- transients in switching – off load and on load tap changers -- Scott connection.

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VIJAYAWADA - 520 001.
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Program Name: B.TECH Faculty Name: RAVI KIRAN U

Class	Semester	Title of The Paper	Paper Code	W.E.F
II YEAR	I	MEFA		11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical ---	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:**

   Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:**

   Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**:

   Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**:

    Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**:

    Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**:

    Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Learning objectives:

• The Learning objectives of this paper is to understand the concept and nature of Managerial Economics and its relationship with other disciplines and also to understand the Concept of Demand and Demand forecasting, Production function, Input Output relationship, Cost-Output relationship and Cost-Volume-Profit Analysis.

• To understand the nature of markets, Methods of Pricing in the different market structures and to know the different forms of Business organization and the concept of Business Cycles.

• To learn different Accounting Systems, preparation of Financial Statement and uses of different tools for performance evaluation. Finally, it is also to understand the concept of Capital, Capital Budgeting and the techniques used to evaluate Capital Budgeting proposals.

Course Outcomes:

*****The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product and the knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs.

*****One is also ready to understand the nature of different markets and Price Output determination under various market conditions and also to have the knowledge of different Business Units.

*****The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis and to evaluate various investment project proposals with the help of capital budgeting techniques for decision making.

Unit-I

Introduction to Managerial Economics and demand Analysis:

Definition of Managerial Economics –Scope of Managerial Economics and its relationship with other subjects –Concept of Demand, Types of Demand, Determinants of Demand- Demand schedule, Demand curve, Law of Demand and its limitations- Elasticity of Demand, Types of Elasticity of Demand and Measurement- Demand forecasting and Methods of forecasting, Concept of Supply and Law of Supply.

Unit – II:

Production and Cost Analyses:

Concept of Production function- Cobb-Douglas Production function- Leontief production function - Law of Variable proportions-Isoquants and Isocosts and choice of least cost factor combination-Concepts of Returns to scale and Economies of scale-Different cost concepts: opportunity costs, explicit and implicit costs- Fixed costs Variable Costs and Total costs – Cost –Volume-Profit analysis-Determination of Breakeven point(simple problems)- Managerial significance and limitations of Breakeven point.

Unit – III:

Introduction to Markets, Theories of the Firm & Pricing Policies:

Market Structures: Perfect Competition, Monopoly, Monopolistic competition and Oligopoly – Features – Price and Output Determination – Managerial Theories of firm: Marris and Williamson's models – other Methods of Pricing: Average cost pricing, Limit Pricing,

Market Skimming Pricing, Internet Pricing: (Flat Rate Pricing, Usage sensitive pricing) and Priority Pricing.

Unit – IV:

Types of Business Organization and Business Cycles:

Features and Evaluation of Sole Trader, Partnership, Joint Stock Company – State/Public Enterprises and their forms – Business Cycles : Meaning and Features – Phases of a Business Cycle.

Unit – V:

Introduction to Accounting & Financing Analysis:

Introduction to Double Entry Systems – Preparation of Financial Statements-Analysis and Interpretation of Financial Statements-Ratio Analysis – Preparation of Funds flow and cash flow statements (Simple Problems)

Unit – VI:

Capital and Capital Budgeting: Capital Budgeting: Meaning of Capital-Capitalization- Meaning of Capital Budgeting-Time value of money- Methods of appraising Project profitability: Traditional Methods(pay back period, accounting rate of return) and modern methods(Discounted cash flow method, Net Present Value method, Internal Rate of Return Method and Profitability Index)

Program Name:EEE Faculty Name:chandrika.vale

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	I	THERMAL AND HYDRO PRIME MOVERS	R1621022	11/06/18

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
86 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO1.**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. **To make the student understand the types of prime movers, which can be connected to generators for power production and should obtain the skills of performing the necessary calculations with respect to the functioning of the prime movers.**

2. **To teach the student about the fundamental of fluid dynamic equations and its applications fluid jets. To impart the knowledge of various types of pumps, their constructional features, working and performance.**

Course Outcomes:

- Understand the fundamentals of IC Engines.
- Evaluate the steam turbines
- Impart fundamentals of gas turbines & analasys of gas turbines.
- Understand the fundamentals of Pumps.
- Evaluate the Hydraulic turbines.

- Analyze the hydro electric power plants

Part-A: Thermal prime movers
Course Objectives: To make the student understand the types of prime movers, which can be connected to generators for power production and should obtain the skills of performing the necessary calculations with respect to the functioning of the prime movers.

UNIT I:

Objectives: To make the student learn about the constructional features, operational details of various types of internal combustion engines through the details of several engine systems and the basic air standard cycles, that govern the engines. Further, the student shall be able to calculate the performance of different types of internal combustion engines.

I.C Engines: Classification, working principles – valve and port timing diagrams – air standard cycles – Engine systems line fuel injection, carburetion, ignition, cooling and lubrication – Engine performance evaluation.

UNIT II:

Objectives: To train the student in the aspects of steam formation and its utilities through the standard steam data tables and charts. To make the student correlate between the air standard cycles and the actual cycles that govern the steam turbines. To train the student to calculate the performance of steam turbines using velocity diagrams.

Properties of Steam and use of Steam Tables- T-S and H-S Diagrams. Analysis of Various Thermodynamic Processes under gone by Steam.
Vapor Power Cycles: Carnot Cycle-Rankine Cycle- Thermodynamic Variables Effecting Efficiency and output of Rankine Cycle-. Analysis of simple Rankine Cycle and Re-heat cycle
Steam Turbines: Schematic layout of steam power plant Classification of Steam Turbines-Impulse Turbine and Reaction Turbine- Compounding in Turbines- Velocity Diagrams for simple Impulse and Reaction Turbines- Work done & efficiency

UNIT III:

Objectives: To impart the knowledge of gas turbine fundamentals, the governing cycles and the methods to improve the efficiency of gas turbines.

Gas Turbines: Simple gas turbine plant-ideal cycle, closed cycle -open cycle-. Efficiency, Work ratio and optimum pressure ratio for simple gas turbine cycle. Actual cycle, analysis of simple cycles & cycles with inter cooling, reheating and Regeneration

Part-B: Hydro prime movers

UNIT IV:
Objectives: To teach the student about the fundamental of fluid dynamic equations and its applications fluid jets. To impart the knowledge of various types of pumps, their

constructional features, working and performance.

IMPACT OF JETS AND PUMPS: Impulse momentum equation, Impact of Jet on stationary and moving vanes (flat and curved). Pumps: Types of pumps, Centrifugal pumps: Main components, Working principle, Multi stage pumps, Performance and characteristic curves

UNIT V:

Objectives: To make the student learn about the constructional features, operational details of various types of hydraulic turbines. Further, the student shall be able to calculate the performance of hydraulic turbines.

HYDRAULIC TURBINES: Classification of turbines; Working principle, Efficiency calculation and Design principles for Pelton Wheel, Francis and for Kaplan turbines; Governing of turbines; Performance and characteristic curves.

UNIT VI:

Objectives: To train the student in the areas of types of hydro electric power plants, estimation and calculation of different loads by considering various factors.

HYDRO POWER: Components of Hydro electric power plant: pumped storage systems, Estimation of water power potential; Estimation of load on turbines: load curve, load factor, capacity factor, utilization factor, diversity factor, load – duration curve, firm power, secondary power, prediction of load.

Program Name: EEE   Faculty Name:D.Suresh Babu

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	I	Basic Electronics and Devices	R1621023	June 11,2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
86 Hours	Theory 6	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO-1: Apply knowledge of mathematics, science, and engineering for solving intricate engineering problems

PO-2 : Identify, formulate and analyze multifaceted engineering problems.

PO-3: Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

PO-4: Design and conduct experiments based on complex engineering problems,as well as to analyze and interpret data.

PO-5 : Use the techniques, skills, and modern engineering tools necessary for engineering practice

PO-6 : Understand the impact of engineering solutions in a global, economic and societal context.

PO-7 : Design and develop eco-friendly systems, making optimal utilization of available natural resources.

PO-8 : Understand professional ethics and responsibilities.

PO-9 : Work as a member and leader in a team in multidisciplinary environment.

PO-10 :Communicate effectively.

PO-11: Manage the projects keeping in view the economical and societal considerations.

PO-12: Recognize the need for adapting to technological changes and engage in lifelong learning

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The subject aims to provide the student with:

1) An understanding of basic EE abstractions on which analysis and design of electrical and electronic circuits and systems are based, including lumped circuit, digital and operational amplifier abstractions.

2) The capability to use abstractions to analyze and design simple electronic circuits.

4) An understanding of how complex devices such as semiconductor diodes and field-effect transistors are modeled and how the models are used in the design and analysis of useful circuits.

5) The capability to design and construct circuits, take measurements of circuit behavior and performance, compare with predicted circuit models and explain discrepancies.

Course Outcomes:

CO#	CO explanation
CO1	Comprehend the concepts of semiconductors and analyze transportation of charge carriers in a semiconductor.
CO2	Analyze the behavior of semiconductor diode and special diodes.
CO3	Apply the knowledge of diodes in analyzing operation of wave rectifiers and filters circuit for voltage regulation.
CO4	Analyze the Transistor Amplifiers.
CO5	Compare various Power Semiconductor Devices.
CO6	Analyze the Power Amplifiers, Feedback Amplifiers and Oscillators

Unit-I:

Review of Semi Conductor Physics: Insulators, Semi conductors, and Metals classification using Energy Band Diagrams, Mobility and Conductivity, Electrons and holes in Intrinsic Semi conductors, Extrinsic Semi Conductor, (P and N Type semiconductor) Hall effect, Generation and Recombination of Charges, Diffusion, Continuity Equation, Injected Minority Carriers, Law of Junction, Introduction to fermi level in Intrinsic, Extrinsic semi conductors with necessary mathematics

Unit-II:

Junction Diode Characteristics

Operation and characteristics of p-n junction diode. Current components in p-n diode, diode equation. Temperature dependence on V–I characteristic, diffusion capacitance and diode resistance (static and dynamic), energy band diagram of p-n diode.

Special Diodes: Avalanche and Zener break down, Zener characteristics, tunnel diode, characteristics with the help of energy band diagrams, Varactor diode, LED, PIN diode, Photo diode

Unit-III:

Rectifiers and Regulators

Half wave rectifier, ripple factor, full wave rectifier (with and without transformer), harmonic components in a rectifier circuit, inductor filter, capacitor filter, L-section filter, P- section filter, and comparison of various filter circuits in terms of ripple factors. Simple circuit of a regulator using Zener diode. Types of regulators-series and shunt voltage regulators, over load voltage protection.

Unit-IV:

Transistors

Junction transistor, transistor current components, transistor as an amplifier and switch. Characteristics of transistor (CE, CB and CC configurations). Transistor biasing and thermal stabilization (to fixed bias, collector to base bias, self bias). Compensation against variation in base emitter voltage and collector current. Thermal runaway. Hybrid model of transistor. Analysis of transistor amplifier using h-parameters

Unit- V:

Power semiconductor devices

Principle of operation and characteristics of Thyristors, Silicon control rectifiers, power IGBT and power MOSFET their ratings. Comparison of power devices.

FET: JFET Characteristics (Qualitative explanation), MOFET Characteristics–static and Transfer (enhancement and depletion mode), low frequency model of FET, FET as an amplifier.

Unit VI :

Amplifiers and oscillator

Feedback Amplifiers -classification, feedback concept, transfer gain and general characteristics of negative feedback amplifiers, effect of feedback on input and output resistances. Methods of analysis of feedback amplifiers.

Power Amplifiers – Classification, push-pull amplifiers, Introduction to harmonics (distortion
factor.

Oscillators – Condition for oscillation, RC-phase shift oscillator. Wein bridge oscillator, Crystal oscillator. Frequency and amplitude stability of oscillators.

Program Name: B.TECH Faculty Name: Mr. N.SAIDA NAIK

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	I	EMF	R1621024	2018-2019

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:**

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:**

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**:

Recognize the need for, and have the preparation and ability to engage in independent

and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To study the production of electric field and potentials due to different configurations of static charges
2. To study the properties of conductors and dielectrics, calculate the capacitance of different configure-various and understand the concept of conduction and convection current densities.
3. To study the magnetic fields produced by currents in different configurations, application of ampere's law and the Maxwell's second and third equations.
4. To study the magnetic force and torque through Lorentz force equation in magnetic field environment like conductors and other current loops
5. To develop the concept of self and mutual inductances and the energy stored. Electrical and Electronics Engineering
6. To study time varying and Maxwell's equations in different forms and Maxwell's fourth equation for the induced Emf.

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Course Outcomes:

1. Students able to calculate electric field and potentials using gauss's law and solving Laplace's or Poison's equations.
2. Learn how to calculate capacitance, energy stored in electric field and get's the concept of conduction and convection currents.
3. Ability to find magnetic field intensity due to current, the application of ampere's law and the Maxwell's second and third equations.
4. Students can calculate the magnetic forces and torque produced by currents in magnetic field.
5. Able to calculate self and mutual inductances and the energy stored in the magnetic field
6. Students will gain knowledge on time varying fields and get ability to calculate induced Emf. Concepts of displacement current and Poynting vector

UNIT I : Electrostatics:

Electrostatic Fields – Coulomb's Law – Electric Field Intensity (EFI) – EFI due to a line and a surface charge – Work done in moving a point charge in an electrostatic field – Electric Potential – Properties of potential function – Potential gradient – Guass's law — Maxwell's first law, div(D)=ρv Laplace's and Poison's equations and Solution of Laplace's equation in one variable.

UNIT-II : Conductors – Dielectrics and Capacitance:

Electric dipole – Dipole moment – potential and EFI due to an electric dipole – Torque on an Electric dipole in an electric field – Behavior of conductors in an electric field – Conductors and Insulators Polarization – Boundary conditions between conduction to Dielectric and dielectric to dielectrics capacitance – capacitance of parallel plates, spherical and coaxial cables with composite dielectrics –Energy stored and energy density in a static electric field – Current density – conduction and Convection current densities – Ohm's law in point form – Equation of
continuity.

UNIT-III: Magneto statics and Ampere's Law:

application of ampere's law and the Maxwell's second and third equations. Static magnetic fields – Biot-Savart's law – Oesterd's experiment – Magnetic field intensity (MFI) – MFI due to a straight current carrying filament – MFI due to circular, square and solenoid current – Carrying wire – Relation between magnetic flux, magnetic flux density and MFI – Maxwell's second Equation, div(B)=0 –Ampere's circuital law and its applications viz. MFI due to an infinite sheet of current and a long filament carrying conductor – Point form of Ampere's circuital law –Field due to a circular loop, rectangular and square loops, Maxwell's third equation, Curl (H)=J.

UNIT-IV: Force in Magnetic fields:

Magnetic force - Moving charges in a Magnetic field – Lorentz force equation – force on a current element in a magnetic field – Force on a straight and a long current carrying conductor in a magnetic field – Force between two straight long and parallel current carrying conductors – Magnetic dipole and dipole moment – a differential current loop as a magnetic dipole – Torque on a current loop placed in a magnetic field.

UNIT-V: Self and Mutual inductance:

Self and Mutual inductance – determination of self-inductance of a solenoid and toroid and mutual inductance between a straight long wire and a square loop wire in the same plane – energy stored and density in a magnetic field.

UNIT-VI: Time Varying Fields:

Time varying fields – Faraday's laws of electromagnetic induction – Its integral and point forms – Maxwell's fourth equation, Curl (E)=$-\partial B/\partial t$ – Statically and Dynamically induced EMFs – Simple problems – Modification of Maxwell's equations for time varying fields – Displacement current – Poynting Theorem and Poynting vector.are solved.

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY

VIJAYAWADA - 520 001.

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Program Name: B.TECH Faculty Name: K.LAKSHMI GANESH

Class	Semester	Title of The Paper	Paper Code	W.E.F
II YEAR	I	Electrical circuits Laboratory		11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
48 Hours	-----	3	3	25	50	2

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:**

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:**

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To verify and demonstrate various thermos, locus diagrams, resonance and two port networks.
2. To determine self and mutual inductance of a magnetic circuit, parameters of a given coil and measurement of 3- phase power.

Course Outcomes:

7. Apply appropriate theorems to electrical circuits and able to distinguish between self and mutual inductances of transformer.
8. Measure Two-port parameters of a given electric circuits.

Syllabus of Electrical Circuits Lab

Any 10 of the following experiments are to be conducted:

1) Verification of Thevenin's and Norton's Theorems

2) Verification of Superposition theorem and Maximum Power Transfer Theorem

3) Verification of Compensation Theorem 4) Verification of Reciprocity , Millmann's Theorems

5) Locus Diagrams of RL and RC Series Circuits

6) Series and Parallel Resonance

7) Determination of Self, Mutual Inductances and Coefficient of coupling

8) Z and Y Parameters

9) Transmission and hybrid parameters

10) Parameters of a choke coil.

11) Determination of cold and hot resistance of an electric lamp.

12) Measurement of 3-phase Power by two Wattmeter Method for unbalanced loads

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Program Name: B. TECH Faculty Name: RAJESH V

Class	Semester	Title of The Paper	Paper Code	W.E. F
II YEAR	II	Electrical Machines -II	R1622022	19/11/2018

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	4	---	3	30	70	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:**

   Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:**

   Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**:

   Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**:

    Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**:

    Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**:

    Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. Understand the principle of operation and performance of 3-phase induction motor.
2. Quantify the performance of induction motor and induction generator in terms of torque and slip.
3. To understand the torque producing mechanism of a single-phase induction motor.
4. To understand the principle of emf generation, the effect of armature reaction and predetermination of voltage regulation in synchronous generators.
5. To study parallel operation and control of real and reactive powers for synchronous generators.
6. To understand the operation, performance and starting methods of synchronous motors.

Course Outcomes:

1. Explain the operation and performance of three induction motor
2. Analyse the torque-speed relation, performance of induction motor and induction generator
3. Implement the starting of single-phase induction motors
4. Perform winding design and predetermine the regulation of synchronous generator
5. Explain parallel operation and control of real and reactive powers for synchronous generators
6. Understand the operation, performance and starting methods of synchronous motor

UNIT-I 3-phase Induction Motors

Construction details of cage and wound rotor machines - production of rotating magnetic field - principle of operation - rotor emf and rotor frequency - rotor current and pf at standstill and during running conditions - rotor power input, rotor copper loss and mechanical power developed and their interrelationship – equivalent circuit – phasor diagram

UNIT-II Characteristics, starting and testing methods of Induction Motors

Torque equation - expressions for maximum torque and starting torque - torque slip characteristic – double cage and deep bar rotors - crawling and cogging – speed control of induction motor with V/f method – no load and blocked rotor tests - circle diagram for predetermination of performance– methods of starting – starting current and torque calculations – induction generator operation (Qualitative treatment only)

UNIT-III Single Phase Motors

Single phase induction motors – Constructional features and equivalent circuit Problem of starting– Double revolving field theory–Starting methods, shaded pole motors, AC Series motor.

UNIT-IV Construction, Operation and Voltage Regulation of Synchronous generator

Constructional features of non–salient and salient pole type – Armature windings – Distributed and concentrated windings – Distribution– Pitch and winding factors –E.M.F equation–Improvements of waveform and armature reaction–Voltage regulation by synchronous impedance method– MMF method and Potier triangle method–Phasor diagrams– Two reaction analysis of salient pole machines and phasor diagram.

UNIT-V Parallel operation of synchronous generators

Parallel operation with infinite bus and other alternators – Synchronizing power – Load sharing – Control of real and reactive power– Numerical problems.

UNIT-VI Synchronous motor – operation, starting and performance

Synchronous Motor principle and theory of operation– Phasor diagram – Starting torque– Variation of current and power factor with excitation –Synchronous condenser – Mathematical analysis for power developed– Hunting and its suppression – Methods of starting – Applications.

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Program Name: B.Tech Faculty Name: Mr. N.SAIDA NAIK

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	II	CONTROL SYSTEMS		19-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3hrs	Internal 30M	External 70M	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem** research literature, and analyze complex engineering problems reaching substantiated **analysis** Identify, formulate, conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3.
4. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

5. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

6. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

7. **The engineer and society:**

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

8. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
9. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
10. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To learn the mathematical modeling of physical systems and to use block diagramalgebra and signal flow graph to determine overall transfer function
2. To analyze the time response of first and second order systems and improvement of performance by proportional plus derivative and proportional plus integral controllers
3. To investigate the stability of closed loop systems using Routh's stability criterion and the analysis by root locus method.
4. To present the Frequency Response approaches for the analysis of linear time invariant (LTI) systems using Bode plots, polar plots and Nyquist stability criterion.
5. To discuss basic aspects of design and compensation of linear control systems using Bode plots.

6. Ability to formulate state models and analyze the systems. To present the concepts of Controllability and Observability

Course Outcomes:

1. Ability to derive the transfer function of physical systems and determination of overall transfer function using block diagram algebra and signal flow graphs.
2. Capability to determine time response specifications of second order systems and to determine error constants.
3. Acquires the skill to analyze absolute and relative stability of LTI systems using Routh's stability criterion and the root locus method.
4. Capable to analyze the stability of LTI systems using frequency response methods.
5. Able to design Lag, Lead, Lag-Lead compensators to improve system performance from Bode diagrams.
6. Ability to represent physical systems as state models and determine the response.

UNIT I

Classification of control systems, Open Loop and closed loop control systems and their differences, Feed-Back Characteristics, transfer function of linear system, Differential equations of electrical networks, Translational and Rotational mechanical systems, Transfer Function of DC Servo motor - AC Servo motor-Synchro, transmitter and receiver – Block diagram algebra – Representation by Signal flow graph - Reduction using Mason's gain formula.

UNIT-II

Time Response Analysis

Standard test signals - Time response of first and second order systems - Time domain specifications -Steady state errors and error constants – Effects of proportional derivative, proportional integral systems.

UNIT-III

The concept of stability – Routh's stability criterion –limitations of Routh's stability –Rootlocus concept - construction of root loci (Simple problems)

UNIT-IV

Frequency Response Analysis

Introduction to Frequency domain specifications-Bode diagrams- transfer function from the Bode Diagram-Phase margin and Gain margin-Stability Analysis from Bode Plots, Polar Plots, Nyquist Stability criterion.

UNIT-V

Classical Control Design Techniques

Lag, Lead, Lag-Lead compensators, design of compensators – using Bode plots.

UNIT-VI

State Space Analysis of LTI Systems

Concepts of state, state variables and state model, state space representation of transfer function, Diagonalization- Solving the time invariant state equations- State Transition Matrix and it's Properties – Concepts of Controllability and Observability.

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Program Name:B.Tech(EEE) Faculty Name :SAI PALLAVI.A

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	II	ELECTRICAL MEASUREMENTS		19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 6	Practical ---	3Hrs	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem** research literature, and analyze complex engineering problems reaching substantiated **analysis** Identify, formulate, conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To study the principle of operation and working of different types of instruments. Measurement of voltage and current.
2. To study the working principle of operation of different types of instruments for measurement of power and energy
3. To understand the principle of operation and working of dc and ac potentiometers.
4. To understand the principle of operation and working of various types of bridges for measurement of parameters –resistance, inductance, capacitance and frequency.

5. To study the principle of operation and working of various types of magnetic measuring instruments.

6. To study the applications of CRO for measurement of frequency, phase difference and hysteresis loop using Lissajous patterns

Course Outcomes:

	COURSE OUTCOMES	Cognitive Levels
CO1	Represent right type of instrument for measurement of voltage and current for ac And dc.	U
CO2	Identify the right type of instrument for measurement of power and energy and able to calibrate energy meter by suitable method	U
CO3	Describe and calibrate DC and AC potentiometers.	Remember
CO4	Select suitable bridge for measurement of electrical parameters	Analyze
CO5	Recognize the use of ballistic galvanometer and flux meter for magnetic measuring instruments	Remember
CO6	Understand how to measure frequency and phase difference between signals using CRO and able to understand the use of digital instruments in electrical measurements.	U

UNIT–I:
Measuring Instruments
Classification – Deflecting, control and damping torques – Ammeters and Voltmeters – PMMC, moving iron type, dynamometer and electrostatic instruments – Expression for the deflecting torque and control torque – Errors and compensations– Extension of range using shunts and series resistance –CT and PT**:** Ratio and phase angle errors – Numerical problems.

UNIT–II:
Measurement of Power and Energy
Single phase and three phase dynamometer wattmeter – LPF and UPF – Expression for deflecting and control torques – Extension of range of wattmeter using instrument transformers – Measurement of active and reactive powers in balanced and unbalanced systems – Type of P.F. Meters – Single phase and three phase dynamometer and moving iron type Single phase induction type energy meter – Driving and braking torques – errors and compensations –Testing by phantom loading using R.S.S. meter– Three phase energy meter – Maximum demand meters– Electrical resonance type frequency meter and Weston type synchro-scope.

UNIT–III:
Potentiometers
Principle and operation of D.C. Crompton's potentiometer – Standardization – Measurement of unknown resistance – Current – Voltage.AC Potentiometers**:** polar and coordinate types –Standardization – Applications.

UNIT–IV:
Measurements of Parameters
Method of measuring low, medium and high resistance – Sensitivity of Wheat stone's bridge– Carey Foster's bridge– Kelvin's double bridge for measuring low resistance– Loss of charge method for

measurement of high resistance – Megger– Measurement of earth resistance – Measurement of inductance – Quality Factor – Maxwell's bridge–Hay's bridge –Anderson's bridge–Measurement of capacitance and loss angle –Desauty Bridge – Schering Bridge–Wagner's earthing device–Wien's bridge.

UNIT–V:

Magnetic Measurements

Ballistic galvanometer – Equation of motion – Flux meter – Constructional details–
Determination of B–H Loop methods of reversals six point method – AC testing – Iron loss of bar samples–Core loss measurements by bridges and potentiometers.

UNIT–VI:

Digital Meters

Digital Voltmeter–Successive approximation – Measurement of phase difference –
Frequency – Hysteresis loop using lissajious patterns in CRO – Ramp and integrating type–Digital frequency meter–Digital multimeter–Digital Tachometer.

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Program Name: B.TECH Faculty Name: V.PRAVEEN

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	II	POWER SYSTEM-1		

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	5	----	3	30	70	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:**

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:**

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To study the principle of operation of different components of a thermal power stations.
2. To study the principle of operation of different components of a Nuclear power stations.
3. To study the concepts of DC/AC distribution systems and voltage drop calculations.
4. To study the constructional and operation of different components of an Air and Gas Insulated substations.
5. To study the constructional details of different types of cables.
6. To study different types of load curves and tariffs applicable to consumers.

Course Outcomes:

1. Students are able to identify the different components of thermal power plants.
2. Students are able to identify the different components of nuclear Power plants.
3. Students are able to distinguish between AC/DC distribution systems and also
4. estimate voltage drops of distribution systems.
5. Students are able to identify the different components of air and gas insulated substations.
6. Students are able to identify single core and multi core cables with different insulating materials.
7. Students are able to analyze the different economic factors of power generation

SYLLABUS OF POWER SYSTEM-1

UNIT-I Thermal Power Stations

Selection of site, general layout of a thermal power plant showing paths of coal, steam, water, air, ash and flue gasses, ash handling system, Brief description of components: Boilers, Super heaters, Economizers, electrostatic precipitators steam Turbines : Impulse and reaction turbines, Condensers, feed water circuit, Cooling towers and Chimney.

UNIT-II Nuclear Power Stations

Location of nuclear power plant, Working principle, Nuclear fission, Nuclear fuels, Nuclear chain reaction, nuclear reactor Components : Moderators, Control rods, Reflectors and Coolants.Types of Nuclear reactors and brief description of PWR, BWR and FBR. Radiation: Radiation hazards and Shielding, nuclear waste disposal.

UNIT-III Distribution Systems

Classification of distribution systems, design features of distribution systems, radial distribution, ring main distribution, voltage drop calculations: DC distributors for following cases - radial DC distributor fed at one end and at both ends (equal / unequal voltages), ring main distributor, stepped distributor and AC distribution, comparison of DC and AC distribution.

UNIT-IV Substations

Classification of substations:
Air Insulated Substations - Indoor & Outdoor substations, Substations layouts of 33/11 kV showing the location of all the substation equipment.
Bus bar arrangements in the Sub-Stations: Simple arrangements like single bus bar, sectionalized single bus bar, double bus bar with one and two circuit breakers, main and transfer bus bar system with relevant diagrams.
Gas Insulated Substations (GIS) – Advantages of Gas insulated substations, different types of gas insulated substations, single line diagram of gas insulated substations, constructional

aspects of GIS, Installation and maintenance of GIS, Comparison of Air insulated substations and Gas insulated substations.

UNIT-V Underground Cables

Types of Cables, Construction, Types of insulating materials, Calculation of insulation resistance, stress in insulation and power factor of cable. Capacitance of single and 3-Core belted Cables: Grading of Cables-Capacitance grading and Inter sheath grading.

UNIT-VI Economic Aspects of Power Generation & Tariff

Economic Aspects - Load curve, load duration and integrated load duration curves, discussion on economic aspects: connected load, maximum demand, demand factor, load factor, diversity factor, power capacity factor and plant use factor, Base and peak load plants.

Tariff Methods- Costs of Generation and their division into Fixed, Semi-fixed and Running Costs, Desirable Characteristics of a Tariff Method, Tariff Methods: Simple rate, Flat Rate, Block-Rate, two-part, three–part, and power factor tariff methods.

Program Name: EEE Faculty Name:D.Suresh Babu

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	II	Switching Theory and Logic Design	R1622023	November 18, 2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
74 Hours	Theory 6	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO-1: Apply knowledge of mathematics, science, and engineering for solving intricate engineering problems
PO-2 : Identify, formulate and analyze multifaceted engineering problems.

PO-3: Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

PO-4: Design and conduct experiments based on complex engineering problems,as well as to analyze and interpret data.

PO-5 : Use the techniques, skills, and modern engineering tools necessary for engineering practice

PO-6 : Understand the impact of engineering solutions in a global, economic and societal context.

PO-7 : Design and develop eco-friendly systems, making optimal utilization of available natural resources.

PO-8 : Understand professional ethics and responsibilities.

PO-9 : Work as a member and leader in a team in multidisciplinary environment.

PO-10 :Communicate effectively.

PO-11: Manage the projects keeping in view the economical and societal considerations.

PO-12: Recognize the need for adapting to technological changes and engage in lifelong learning

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- Explain the elements of digital system abstractions such as digital representations of information, digital logic, Boolan algebra, state elements and finite state machine (FSMs).
- Design simple digital systems based on these digital abstractions, using the "digital paradigm" including discrete sampled information.
- Use the "tools of the trade": basic instruments, devices and design tools.
- Work in a design team that can propose, design, successfully implement and report on a digital systems project.
- Communicate the purpose and results of a design project in written and oral presentations.

Course Outcomes:

CO#	CO Explanation
CO1	Determine the philosophy of number systems and codes.
CO2	Simplify the logic expressions using Boolean laws and postulates and design them by using logic gates. Minimize the logic expressions using map method and tabular method.
CO3	Design of combinational logic circuits using conventional gates.
CO4	Design of combinational logic using various PLD's and synthesizing of threshold functions.
CO5	Analyze and design sequential systems composed of standard sequential modules, such as flip-flops and latches, counters and registers.
CO6	Design the FSM for completely specified and incompletely specified sequential machines.

UNIT – I

REVIEW OF NUMBER SYSTEMS & CODES:

i) Representation of numbers of different radix, conversation from one radix to another radix, r-1's compliments and r's compliments of signed members, problem solving.

ii) 4 bit codes, BCD, Excess-3, 2421, 84-2-1 9's compliment code etc.,

iii) Logic operations and error detection & correction codes; Basic logic operations - NOT, OR, AND, Universal building blocks, EX-OR, EX-NOR - Gates, Standard SOP and POS, Forms, Gray code, error detection, error correction codes (parity checking, even parity, odd parity, Hamming code) NAND-NAND and NOR-NOR realizations.

UNIT – II

MINIMIZATION TECHNIQUES:

Boolean theorems, principle of complementation & duality, De-morgan theorems, minimization of logic functions using Boolean theorems, minimization of switching functions using K-Map up to 6 variables, tabular minimization, problem solving (code converters using K-Map etc..).

UNIT – III

COMBINATIONAL LOGIC CIRCUITS DESIGN :

Design of Half adder, full adder, half subtractor, full subtractor, applications of full adders, 4-bit binary subtractor, adder-subtractor circuit, BCD adder circuit, Excess 3 adder circuit, look-a-head adder circuit, Design of decoder, demultiplexer, 7 segment decoder, higher order demultiplexing, encoder, multiplexer, higher order multiplexing, realization of Boolean functions using decoders and multiplexers, priority encoder, 4-bit digital comparator.

UNIT – IV

INTRODUCTION OF PLD's :

PROM, PAL, PLA-Basics structures, realization of Boolean function with PLDs, programming tables of PLDs, merits & demerits of PROM, PAL, PLA comparison, realization of Boolean functions using PROM, PAL, PLA, programming tables of PROM,PAL, PLA.

UNIT – V

SEQUENTIAL CIRCUITS I:

Classification of sequential circuits (synchronous and asynchronous); basic flip-flops, truth tables and excitation tables (nand RS latch, nor RS latch, RS flip-flop, JK flip-flop, T flip-flop, D flip-flop with reset and clear terminals). Conversion from one flip-flop to flip-flop. Design of ripple counters, design of synchronous counters, Johnson counter, ring counter. Design of registers - Buffer register, control buffer register, shift register, bi-directional shift register, universal shift register.

UNIT – VI

SEQUENTIAL CIRCUITS II :

Finite state machine; Analysis of clocked sequential circuits, state diagrams, state tables, reduction of state tables and state assignment, design procedures. Realization of circuits using various flip-flops. Meelay to Moore conversion and vice-versa.

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Program Name: B.TECH Faculty Name: K.NARENDRA/V.M/A.S.P

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	II	Electrical Machines-I Laboratory		19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
48 Hours	-----	3	3	25	50	2

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:**

   Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:**

   Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**:

   Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**:

    Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**:

    Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**:

    Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To plot the magnetizing characteristics of DC shunt generator and understand the Mechanism of self-excitation.
2. To control the speed of the DC motors.
3. Determine and predetermine the performance of DC machines.
4. To predetermine the efficiency and regulation of transformers and assess their performance.

Course Outcomes:

1. Able to determine and predetermine the performance of DC machines and Transformers.
2. Able to control the speed of DC motor.
3. Able to achieve three phase to two phase transformation.

Syllabus of Electrical Machines-I Lab

Any 10 of the following experiments are to be conducted:

1. Magnetization characteristics of DC shunt generator. Determination of critical field resistance and critical speed.
2. Brake test on DC shunt motor. Determination of performance curves.
3. Hopkinson’s test on DC shunt machines. Predetermination of efficiency.
4. Swinburne’s test and Predetermination of efficiencies as Generator and Motor.
5. Speed control of DC shunt motor by Field and armature Control.
6. Retardation test on DC shunt motor. Determination of losses at rated speed.
7. Separation of losses in DC shunts motor.
8. Oc& SC test on single phase transformer.
9. Sumpner’s test on single phase transformer.
10. Scott connection of transformers
11. Parallel operation of Single phase Transformers
12. Separation of core losses of a single phase transformer
13. Heat run test on a bank of 3 Nos. of single phase Delta connected transformers

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Program Name:B.Tech Faculty Name: R. RAJESH

Class	Semester	Title of The Paper	Paper Code	W.E.F
III B.Tech	I	POWER SYSTEMS-II		11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3hrs	Internal 30M	External 70M	

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem** research literature, and analyze complex engineering problems reaching substantiated **analysis** Identify, formulate, conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To study different parameters of transmission lines
2. To study and analysis the performance of short transmission lines.
3. To study and analysis the performance of long transmission lines.
4. To study and analysis of various power system transients.
5. To study the different factors affecting long transmission lines and the effect of corona.
6. To study the effect of sag and design of various types of insulators.

Course Outcomes

1. Design parameters of various types of transmission lines for using calculation and behavior during different operating conditions.
2. Analyze the specific transmission lines short and medium type which would have application in medium and high voltage power transmission systems.
3. Evaluate the performance of long transmission lines surge propagation, reflection and refraction in transmission lines. Such output will be useful in protecting transmission line insulators and designing level of insulation coordination at various high voltages.
4. Evaluate the surge behavior of transmission line for protection of connects equipments ,viz .power transformer and system connected shunt reactors
5. Apply the various phenomenons related to charged line transmitting different level of power.
6. Analyze the physical and geometrical parameters of transmission line for safe and efficient performance during operating condition of voltage and power.

UNIT–I:

Transmission Line Parameters

Types of conductors – Calculation of resistance for solid conductors –Calculation of inductance for single phase and three phase– Single and double circuit lines– Concept of GMR and GMD–Symmetrical and asymmetrical conductor configuration with and without transposition–Numerical Problems Calculation of capacitance for 2 wire and 3 wire systems – Effect of ground on capacitance – Capacitance calculations for symmetrical and asymmetrical single and three phase–Single and double circuit lines–Numerical Problems.

UNIT–II:

Performance of Short and Medium Length Transmission Lines

Classification of Transmission Lines – Short, medium, long line and their model representations –Nominal-T–Nominal-Pie and A, B, C, D Constants Electrical and Electronics Engineering

for symmetrical and Asymmetrical Networks– Numerical Problems–Mathematical Solutions to estimate regulation and efficiency of all types of lines – Numerical Problems.

UNIT–III:

Performance of Long Transmission Lines

Long Transmission Line–Rigorous Solution – Evaluation of A,B,C,D Constants–Interpretation of the Long Line Equations – Incident, Reflected and Refracted Waves –Surge Impedance and SIL of Long Lines–Wave Length and Velocity of Propagation of Waves – Representation of Long Lines – Equivalent-T and Equivalent Pie network models (Numerical Problems).

UNIT – IV:

Power System Transients

Types of System Transients – Travelling or Propagation of Surges –Attenuation–Distortion – Reflection and Refraction Coefficients Termination of lines with different types of conditions – Open Circuited Line–Short Circuited Line – T Junction– Lumped Reactive Junctions (Numerical Problems).

UNIT–V:

Various Factors Governing the Performance of Transmission line

Skin and Proximity effects – Description and effect on Resistance of Solid Conductors –Ferranti effect – Charging Current – Effect on Regulation of the Transmission Line–Shunt Compensation –Corona – Description of the phenomenon–Factors affecting corona–Critical voltages and power loss Radio Interference –Power factor improvement methods.

UNIT–VI:

Sag and Tension Calculations and Overhead Line Insulators

Sag and Tension calculations with equal and unequal heights of towers–Effect of Wind and Ice on weight of Conductor–Numerical Problems –Stringing chart and sag template and its applications–Types of Insulators – String efficiency and Methods for improvement–Numerical Problems –Voltage distribution–Calculation of string efficiency–Capacitance grading and Static Shielding.

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Program Name:B.Tech(EEE) Faculty Name :SAI PALLAVI.A

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	II	ELECTRICAL MEASUREMENTS		19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	6	---	3Hrs	30	70	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem** research literature, and analyze complex engineering problems reaching substantiated **analysis** Identify, formulate, conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

7. To study the principle of operation and working of different types of instruments. Measurement of voltage and current.

8. To study the working principle of operation of different types of instruments for measurement of power and energy

9. To understand the principle of operation and working of dc and ac potentiometers.

10. To understand the principle of operation and working of various types of bridges for measurement of parameters –resistance, inductance, capacitance and frequency.

11. To study the principle of operation and working of various types of magnetic measuring instruments.

12. To study the applications of CRO for measurement of frequency, phase difference and hysteresis loop using Lissajous patterns

Course Outcomes:

	COURSE OUTCOMES	Cognitive Levels
CO1	Represent right type of instrument for measurement of voltage and current for ac And dc.	U
CO2	Identify the right type of instrument for measurement of power and energy and able to calibrate energy meter by suitable method	U
CO3	Describe and calibrate DC and AC potentiometers.	Remember
CO4	Select suitable bridge for measurement of electrical parameters	Analyze
CO5	Recognize the use of ballistic galvanometer and flux meter for magnetic measuring Instruments	Remember
CO6	Understand how to measure frequency and phase difference between signals using CRO and able to understand the use of digital instruments in electrical measurements.	U

UNIT–I:

Measuring Instruments

Classification – Deflecting, control and damping torques – Ammeters and Voltmeters – PMMC, moving iron type, dynamometer and electrostatic instruments – Expression for the deflecting torque and control torque – Errors and compensations– Extension of range using shunts and series resistance –CT and PT**:** Ratio and phase angle errors – Numerical problems.

UNIT–II:

Measurement of Power and Energy

Single phase and three phase dynamometer wattmeter – LPF and UPF – Expression for deflecting and control torques – Extension of range of wattmeter using instrument transformers – Measurement of active and reactive powers in balanced and unbalanced systems – Type of P.F. Meters – Single phase and three phase dynamometer and moving iron type Single phase induction type energy meter – Driving and braking torques – errors and compensations –Testing by phantom loading using R.S.S. meter– Three phase energy meter – Maximum demand meters– Electrical resonance type frequency meter and Weston type synchro-scope.

UNIT–III:

Potentiometers

Principle and operation of D.C. Crompton’s potentiometer – Standardization – Measurement of unknown resistance – Current – Voltage.AC Potentiometers**:** polar and coordinate types –Standardization – Applications.

UNIT–IV:

Measurements of Parameters

Method of measuring low, medium and high resistance – Sensitivity of Wheat stone’s bridge– Carey Foster’s bridge– Kelvin’s double bridge for measuring low resistance– Loss of charge method for measurement of high resistance – Megger– Measurement of earth resistance – Measurement of inductance – Quality Factor – Maxwell’s bridge–Hay’s bridge –Anderson’s bridge–Measurement of capacitance and loss angle –Desauty Bridge – Schering Bridge–Wagner’s earthing device–Wien’s bridge.

UNIT–V:

Magnetic Measurements

Ballistic galvanometer – Equation of motion – Flux meter – Constructional details–
Determination of B–H Loop methods of reversals six point method – AC testing – Iron loss of bar samples–Core loss measurements by bridges and potentiometers.

UNIT–VI:

Digital Meters

Digital Voltmeter–Successive approximation – Measurement of phase difference –
Frequency – Hysteresis loop using lissajious patterns in CRO – Ramp and integrating type–Digital frequency meter–Digital multimeter–Digital Tachometer.

Program Name: B.TECH Faculty Name: V.PRAVEEN

Class	Semester	Title of The Paper	Paper Code	W.E.F
III YEAR	I	RESS		11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical ---		Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:**

   Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:**

   Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**:

   Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**:

    Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**:

    Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**:

    Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

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PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To study the solar radiation data, extraterrestrial radiation, radiation on earth's surface.
2. To study solar thermal collections.
3. To study solar photo voltaic systems.
4. To study maximum power point techniques in solar pv and wind energy.
5. To study wind energy conversion systems, Betz coefficient, tip speed ratio.
6. To study basic principle and working of hydro, tidal, biomass, fuel cell and geothermal systems.

Course Outcomes:

	COURSE OUTCOMES
CO1	Analyze solar radiation data, extraterrestrial radiation, radiation on earth's surface.
CO2	Design solar thermal collections.
CO3	Design solar photo voltaic systems.
CO4	Develop maximum power point techniques in solar PV and wind.
CO5	Explain wind energy conversion systems, Betz coefficient, tip speed ratio.
CO6	Explain basic principle and working of hydro, tidal, biomass, fuel cell and geothermal systems.

SYLLABUS

UNIT–I:

Fundamentals of Energy Systems

Energy conservation principle – Energy scenario (world and India) – Solar radiation**:** Outside earth's atmosphere – Earth surface – Analysis of solar radiation data – Geometry – Radiation on tilted surfaces – Numerical problems.

UNIT–II:

Solar Thermal Systems

Liquid flat plate collections**:** Performance analysis – Transmissivity – Absorptivity product collector efficiency factor – Collector heat removal factor – Numerical problems. Introduction to solar air heaters – Concentrating collectors and solar pond.

UNIT–III:

Solar Photovoltaic Systems

Balance of systems – IV characteristics – System design**:** storage sizing – PV system sizing – Maximum power point techniques**:** Perturb and observe (P&O) technique – Hill climbing technique.

UNIT–IV:

Wind Energy

Wind patterns – Types of turbines – Kinetic energy of wind – Betzcoefficient – Tip–speed ratio – Efficiency – Power output of wind turbine –Selection of generator(synchronous, induction) – Maximum power point tracking.

UNIT–V:

Hydro and Tidal power systems

Basic working principle – Classification of hydro systems**:** Large, small,micro – measurement of head and flow – Energy equation – Types of turbines – Numerical problems.Tidal power – Basics – Kinetic energy equation – Numerical problems –Wave power – Basics – Kinetic energy equation.

UNIT–VI:

Biomass, fuel cells and geothermal systems

Biomass Energy**:** Fuel classification – Pyrolysis – Direct combustion of heat– Different digesters and sizing.

Fuel cell**:** Classification – Efficiency – VI characteristics.

Geothermal**:** Classification – Dry rock and acquifer – Energy analysis.

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Program Name: B.TECH Faculty Name: K.NARENDRA/K.L.GANESH

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	II	Electrical Machines-II Laboratory		12/16/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
48 Hours	-----	3	3	25	50	2

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:**

   Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:**

   Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**:

   Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**:

    Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**:

    Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**:

    Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To control the speed of three phase induction motors.
2. To determine /predetermine the performance three phase and single phase induction motors.
3. To improve the power factor of single phase induction motor .
4. To predetermine the regulation of three–phase alternator by various methods, find Xd/Xq ratio of alternator and asses the performance of three–phase synchronous motor.

Course Outcomes:

1. Able to assess the performance ofsingle phase and three phase induction motors.
2. Able to control the speed of three phase induction motor.
3. Able to predetermine the regulation of three–phase alternator by various methods.
4. Able to find the Xd / Xq ratio of alternator and asses the performance of three–phase synchronous motor

Syllabus of Electrical Machines-II Lab

The following experiments are required to be conducted as compulsory experiments:

1. Brake test on three phase Induction Motor
2. No–load & Blocked rotor tests on three phase Induction motor
3. Regulation of a three –phase alternator by synchronous impedance & M.M.F Methods.
4. Regulation of three–phase alternator by Potier triangle method
5. V and Inverted V curves of a three—phase synchronous motor.
6. Determination of Xd and Xq of a salient pole synchronous machine
7. Equivalent circuit of single phase induction motor
8. Speed control of induction motor by V/f method.
9. Determination of efficiency of three phase alternator by loading with three phase induction motor.
10. Power factor improvement of single phase induction motor by using capacitors and load test on single phase induction motor.

Program Name: EEE Faculty Name:B.Praveen Kitti

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	I	Signals & Systems	R1631023	June 11,2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
84 Hours	Theory 6	Practical	3	Internal 30	External 70	3

Programme Outcomes:

PO-1: Apply knowledge of mathematics, science, and engineering for solving intricate engineering problems

PO-2 : Identify, formulate and analyze multifaceted engineering problems.

PO-3: Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

PO-4: Design and conduct experiments based on complex engineering problems,as well as to analyze and interpret data.

PO-5 : Use the techniques, skills, and modern engineering tools necessary for engineering practice

PO-6 : Understand the impact of engineering solutions in a global, economic and societal context.

PO-7 : Design and develop eco-friendly systems, making optimal utilization of available natural resources.

PO-8 : Understand professional ethics and responsibilities.

PO-9 : Work as a member and leader in a team in multidisciplinary environment.

PO-10 :Communicate effectively.

PO-11: Manage the projects keeping in view the economical and societal considerations.

PO-12: Recognize the need for adapting to technological changes and engage in lifelong learning

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The objectives of this course are

1. to develop good understanding about signals, systems and their classification;
2. to develop expertise in time-domain and frequency domain approaches to the analysis of continuous and discrete systems;
3. Analyze the continuous-time signals and continuous-time systems using Fourier series, Fourier transform and Laplace transform.
4. Apply z-transform to analyze discrete-time signals and systems.

Course Outcomes:

1. Determine the mathematical representation and classify the signals based on their properties and represent signals in terms of mutual orthogonality.
2. Knowledge of Frequency domain representation and analysis concepts using Fourier Transforms & Sampling.
3. Analyze an LTI system and understand the concepts of sampling theorem and apply it to reconstruct analog signals.
4. Illustrate the process of convolution and correlation between signals, its implication for analysis of linear time invariant systems.
5. Determine the properties of continuous time signals and system using Laplace transforms.

UNIT- I: INTRODUCTION: Definition of Signals and Systems, Classification of Signals, Classification of Systems, Operations on signals: time-shifting, time-scaling, amplitude-shifting, amplitude-scaling. Problems on classification and characteristics of Signals and Systems. Complex exponential and sinusoidal signals, Singularity functions and related functions: impulse function, step function signum function and ramp function. Analogy between vectors and signals, orthogonal signal space, Signal approximation using Orthogonal functions, Mean square error, closed or complete set of orthogonal functions, Orthogonality in complex functions.

UNIT –II: FOURIER SERIES AND FOURIER TRANSFORM:
Fourier series representation of continuous time periodic signals, properties of Fourier series, Dirichlet's conditions, Trigonometric Fourier series and Exponential Fourier series, Complex Fourier spectrum. Deriving Fourier transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Fourier transform of periodic signals, properties of Fourier transforms, Fourier transforms involving impulse function and Signum function. Introduction to Hilbert Transform.

UNIT –III: SAMPLING THEOREM – Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling – Aliasing, Introduction to Band Pass sampling.

UNIT-IV: ANALYSIS OF LINEAR SYSTEMS: Linear system, impulse response, Response of a linear system, Linear time invariant (LTI) system, Linear time variant (LTV) system, Concept of convolution in time domain and frequency domain, Graphical representation of convolution, Transfer function of a LTI system. Filter characteristics of linear systems. Distortion less transmission through a system, Signal bandwidth, system bandwidth, Ideal LPF, HPF and BPF characteristics, Causality and Poly-Wiener criterion for physical realization, relationship between bandwidth and rise time.
Cross-correlation and auto-correlation of functions, properties of correlation function, Energy density spectrum, Parseval's theorem, Power density spectrum, Relation between auto correlation function and energy/power spectral density function. Relation between convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

UNIT –V: LAPLACE TRANSFORMS : Review of Laplace transforms, Partial fraction expansion, Inverse Laplace transform, Concept of region of convergence (ROC) for Laplace transforms, constraints on ROC for various classes of signals, Properties of L.T's, Relation between L.T's, and F.T. of a signal. Laplace transform of certain signals using waveform
synthesis.

UNIT –VI: Z–TRANSFORMS : Fundamental difference between continuous-time and discrete-time signals, discrete time signal representation using complex exponential and sinusoidal components, Periodicity of discrete time using complex exponential signal, Concept of Z- Transform of a discrete sequence. Distinction between Laplace, Fourier and Z transforms. Region of convergence in Z-Transform, constraints on ROC for various classes of signals, Inverse Z-transform, properties of Z-transforms.

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY

VIJAYAWADA - 520 001.

Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: III. B.Tech Faculty Name: Mr.G RAMBABU

Class	Semester	Title of The Paper	Paper Code	W.E.F
III EEE	II	DATA STRUCTDURES Lab	R16	19-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
81 Hours	Theory 6	Practical	3	Internal 30	External 70	3

Programme Outcomes:

Program Outcome	
PO1.	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
Selected as application of knowledge of mathematics and science is involved in calculating troubles by chemical methods **and instrumental methods of analysis.**	
PO2.	Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Selected as students can identify and analyze complex engineering problems and can adopt new methods .	
PO3.	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
Selected as the student can develop chemical **and instrumental methods for the public health and safety, and the cultural, societal, and environmental considerations.**	
PO4.	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Selected as students are required to do experiments using electronic devices like conductometers, potentiometers.	
PO5.	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
selected as the course apply appropriate techniques and modern engineering tools	
PO6.	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
selected as the contextual knowledge of conductance, potential of materials helps to assess societal, health and safety issues	
PO7.	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
Selected as the course address issues related to environment and sustainability.	
PO8.	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
Selected as the course apply ethical principles and responsibilities and norms of the engineering practice.	
PO9.	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
Not selected as the course does not related.	
PO10.	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
Not Selected as the course does not address complex engineering activities with the engineering community.	
PO11.	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
Not Selected as course does not relate to this.	
PO12.	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
Selected as student can recognize the need for life-long learning in the context of technological change.	

Programme Specific Outcomes:

PSO (Program Specific Outcomes):

PSO1: The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines. [K4]

PSO2: The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system [K1]

PSO3: The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them. [K2]

PSO4: The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector. [K2]

Course Objectives:

❖ Apply advanced data structure strategies for exploring complex data structures.

❖ Compare and contrast various data structures and design techniques in the area Of Performance.

❖ Implement all data structures like stacks, queues, trees, lists and graphs and compare their Performance and tradeoffs.

Data Structures [R16]

UNIT-I: INTRODUCTION

Data Structures, Definition, Data Structure Operations, Abstract Data Types, Complexity of Algorithms-Time- Space, Arrays, Representation of Arrays, Linear Arrays, Insertion, Deletion and Traversal of Linear Array, Array as an ADT, Multi dimensional Arrays, ,Strings, string Operations, Storing strings, String as an ADT.

Unit –II: STACKS AND QUEUES:

Stack, Definition, Array Representation of stack, The Stack ADT, Applications of stack: Prefix, Infix , Postfix Arithmetic Expressions, Conversion, Evaluation of postfix Expressions, Recursion, Towers of Hanoi, Queues, Definition, Array Representation of Queue, The Queue ADT, Circular Queues, Dequeues, Priority Queues

UNIT-III: LINKED LISTS

Pointers, Pointer Arrays Linked lists, Node Representation Single Linked List Traversing and Searching Insertion into Deletion from a SLL Header Linked Lists, Circular Linked Lists, Doubly Liked Lists Linked Stacks and Queues, Polynomials, Polynomial Representation- Sparse Matrices, Revision

UNIT-IV: TREES-

Introduction, Terminology, Representation of Trees Binary Trees, Properties of Binary Tress, Binary Tree Representations Binary Tree Traversal Pre order, In order Post Order Traversal Threads, Thread Binary Trees, Balanced Binary Trees, Heaps, Definition of a Max Heap, Insertion into a Max Heap Deletion from the Max Heap Binary Search Trees, Definition, Searching , Insertion, Deletion from a Binary Search Tree Height of Binary Search Tree m-way search Trees, B-Trees

UNIT-V: GRAPHS - Graph Terminology -Introduction, Definition Graph Representation, Graph Operations Depth First Search Breadth First Search Connected Components, Spanning Trees Bi Connected Components, Minimum Cost Spanning Trees Kruskal's Algorithm, Prim' s Algorithm , Shortest Paths and Transitive Closure All Paris Shortest Path, Warshall's Algorithms

UNIT-VI: SORTING AND SORTING: Introduction Searching, Definition, Linear Search Binary Search, Fibonacci search Quick Sort, Hashing, , Sorting, Definition, Bubble sort, Insertion Sort, Selection Sort, Quick sort, Merging , Merge Sort , Iterative Merge Sort , Recursive Merge Sort Shell Sort Radix Sort, Heap Sort

Text Books:

1. Fundamentals of Data Structures in C, 2nd Edition, E. Horowitz, S. Sahni and Susan Anderson Freed, Universities Press Pvt. Ltd.

2. Data Structures with C, Seymour Lipschutz, Schaum's Outlines, Tata McGraw Hill.

Course Outcomes: At the end of the course the student will be able to:

	Course Outcomes	**Cognitive Levels**
CO1(K2)	**Understand** different ADT's like Arrays, Array Types, Strings and its Operations	Understand
CO2(K4)	**Understand & Analyze** Stack & Queue ADT's using Arrays and Linked lists	Analyze
CO3(K4)	**Understand & Analyze** Single, Circular, Double linked list ADT's	Analyze
CO4(K4)	**Understand & Analyze** various operations on Binary Tree, Threaded Binary Tree, Heap Tree, Binary Search Tree	Analyze
CO5(K4)	**Understand & Analyze** Graph ADT, Traversals, Minimum Cost Spanning Trees Algorithms, Shortest Paths and Transitive Closure Algorithms	Analyze
CO6(K4)	**Understand & Analyze** Insertion, merge, quick and heap Sorting Technics.	Analyze

Program Name: III. B.Tech Faculty Name: Mr.G RAMBABU

Class	Semester	Title of The Paper	Paper Code	W.E.F
III EEE	II	DATA STRUCTDURES Lab	R16	19-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
39 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

Program Outcome	
PO1.	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
Selected as application of knowledge of mathematics and science is involved in calculating troubles by chemical methods **and instrumental methods of analysis.**	
PO2.	Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Selected as students can identify and analyze complex engineering problems and can adopt new methods .	
PO3.	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
Selected as the student can develop chemical **and instrumental methods for the public health and safety, and the cultural, societal, and environmental considerations.**	
PO4.	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
Selected as students are required to do experiments using electronic devices like conductometers, potentiometers.	

PO5.	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
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PO9.	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
Not selected as the course does not related.	
PO10.	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
Not Selected as the course does not address complex engineering activities with the engineering community.	
PO11.	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
Not Selected as course does not relate to this.	
PO12.	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
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Programme Specific Outcomes:

PSO (Program Specific Outcomes):

PSO1: The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines. [K4]

PSO2: The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system [K1]

PSO3: The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them. [K2]

PSO4: The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector. [K2]

Course Objectives:

- ❖ Apply advanced data structure strategies for exploring complex data structures.
- ❖ Compare and contrast various data structures and design techniques in the area Of Performance.
- ❖ Implement all data structures like stacks, queues, trees, lists and graphs and compare their Performance and tradeoffs.

Course Outcomes:

CO1: Develop Linear, Non Linear Data Structures and sorting techniques.

List of Experiments

1. Implementation of Singly linked list.
2. Implementation of Doubly linked list.
3. Implementation of Multi stacks in a Single Array.
4. Implementation of Circular Queue
5. Implementation of Binary Search trees.
6. Implementation of Hash table.
7. Implementation of Heaps.
8. Implementation of Breadth First Search Techniques.
9. Implementation of Depth First Search Techniques.
10. Implementation of Prim's Algorithm.
11. Implementation of Dijkstra's Algorithm.
12. Implementation of Kruskal's Algorithm
13. Implementation of Merge Sort
14. Implementation of Quick Sort
15. Implementation of Data Searching using divides and conquers technique

Program Name: III. B.Tech **Faculty Name: D. Gowthami / J. Anusha**

Class	Semester	Title of The Paper	Paper Code	W.E.F
EEE	III-II	**MPMC LAB**	**R1632027**	19-11-2018

.Total No. of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The main objectives of the course is to impart

- To study programming based on 8086 microprocessor and 8051 microcontroller.
- To study 8086 microprocessor based ALP using arithmetic, logical and shift operations.
- To study to interface 8086 with I/O and other devices.
- To study parallel and serial communication using 8051& PIC 18 micro controllers.

Course Outcomes:

Student able to:

CO1: Will be able to write assembly language program using 8086 micro based on arithmetic, logical, and shift operations.

CO2: Will be able to interface 8086 with I/O and other devices.

CO3: Will be able to do parallel and serial communication using 8051 & PIC 18 micro controllers.

Name of the Faculty: V.MATTHEW
Course: POWER SYSTEM ANALYSIS
Year & Semester: III-II   Branch: EEE

1) Syllabus

UNIT –I:
Per Unit Representation & Topology
Per Unit Quantities–Single line diagram– Impedance diagram of a power system – Graph theory definition – Formation of element node incidence and bus incidence matrices – Primitive network representation – Formation of Y–bus matrix by singular transformation and direct inspection methods.
UNIT –II:
Power Flow Studies
Necessity of power flow studies – Derivation of static power flow equations– Power flow solution using Gauss-Seidel Method – Newton Raphson Method (Rectangular and polar coordinates form) –Decoupled and Fast Decoupled methods (Algorithmic approach) – Problems on 3–bus system only.

UNIT –III:
Z–Bus formulation
Formation of Z–Bus**:** Partial network– Algorithm for the Modification of Zbus Matrix for addition element for the following cases**:** Addition of element from a new bus to reference– Addition of element from a new bus to an old bus– Addition of element between an old bus to reference and Addition of element between two old busses (Derivations and Numerical Problems).– Modification of Z–Bus for the changes in network (Problems).
UNIT – IV:
Symmetrical Fault Analysis
3–Phase short circuit currents and reactances of synchronous machine–Short circuit MVA calculations.
UNIT –V:
Symmetrical Components & Fault analysis
Synthesis of unsymmetrical phasor from their symmetrical components– Symmetrical components of unsymmetrical phasor–Phase - shift of symmetrical components in Y–Δ–Power in terms of symmetrical components – Sequence networks – Positive, negative and zero sequence networks– Various types of faults LG– LL– LLG and LLL on unloaded alternator–
unsymmetrical faults on power system.
UNIT – VI:
Power System Stability Analysis
Elementary concepts of Steady state– Dynamic and Transient Stabilities– Description of Steady State Stability Power Limit–Transfer Reactance– Synchronizing Power Coefficient –Power Angle Curve and Determination of Steady State Stability –Derivation of Swing Equation–Determination of Transient Stability by Equal Area Criterion–Application of Equal Area
Criterion–Methods to improve steady state and transient stability

3) COURSE Objectives:

i) Able to draw an impedance diagram for a power system network and to form a Y bus matrix for a power system network with or without mutual couplings.
ii) Able to find out the load flow solution of a power system network using different types of load flow methods.
iii) Able to formulate the Z bus for a power system network.
iv) Able to find out the fault currents for all types faults with a view to

provide data for the design of protective devices.

v) Able to find out the sequence components of currents for any unbalanced power system network.

vi) Able to analyze the steady state, transient and dynamic stability concepts of a power system

4) COURSE OUTCOMES:

After the completion of the course the student will be able to:

	COURSE OUTCOMES	Cognitive Levels
CO1	Able to draw an impedance diagram for a power system network and to form a Y-bus matrix for a power system network with or without mutual couplings	ANALYSE
CO2	Able to find out the load flow solution of a power system network using different types of load flow methods	ANALYSE
CO3	Able to formulate the Z bus for a power system network	ANALYSE
CO4	Able to find out the fault currents for all types faults with a view to provide data for the design of protective devices.	ANALYSE
CO5	Able to find out the sequence components of currents for any unbalanced power system network.	ANALYSE
CO6	Able to analyze the steady state, transient and dynamic stability concepts of a power system	ANALYSE

PROGRAM OUTCOMES (POs)

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem** research literature, and analyze complex engineering problems reaching substantiated **analysis** Identify, formulate, conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. The engineer and society:

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts,and demonstrate the knowledge of, and need for sustainable development.
8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. Individual and team work: Function effectively as an individual, and as amember or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Program Name: B.TECH (EEE) Faculty Name: Musthak Ahmed Shaik

Class	Semester	Title of The Paper	Paper Code	W.E.F
III rd year	IInd	Power Electronics Controllers & Drives	RT32026	**19-11-2018**

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	4	0	3Hrs	30	70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
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Program Specific Outcomes [PSOs]:

1. **PSO1:**:The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.
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3. **PSO3:**:The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.
4. **PSO4:**:The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- To learn the fundamentals of electric drive and different electric braking methods.
- To analyze the operation of three phase converter controlled dc motors and four quadrant operation of dc motors using dual converters.
- To discuss the converter control of dc motors in various quadrants.
- To understand the concept of speed control of induction motor by using AC voltage controllers and voltage source inverters.
- To learn the principles of static rotor resistance control and various slip power recovery schemes.
- To understand the speed control mechanism of synchronous motors

Course Outcomes:

	COURSE OUTCOMES	Cognitive Levels
CO1	Able to explain the fundamentals of electric drive and different electric braking methods	Understand
CO2	Able to analyze the operation of three phase converter controlled dc motors and four quadrant operation of dc motors using dual converters.	Understand
CO3	Able to explain the converter control of dc motors in various quadrants	Understand
CO4	Able to explain the concept of speed control of induction motor by using ac voltage controllers and voltage source inverters.	Understand
CO5	Able to explain the principles of static rotor resistance control and various slip power recovery schemes.	Understand
CO6	Able to explain the speed control mechanism of synchronous motors	Understand

SYLLABUS

UNIT–I:

Fundamentals of Electric Drives

Electric drive – Fundamental torque equation – Load torque components – Nature and classification of load torques – Steady state stability – Load equalization– Four quadrant operation of drive (hoist control) – Braking methods**:** Dynamic – Plugging – Regenerative methods.

UNIT–II:

Three phase converter controlled DC motors

Revision of speed control techniques – Separately excited and series motors controlled by full converters – Output voltage and current waveforms – Speed-torque expressions – Speed-torque characteristics – Numerical problems – Four quadrant operation using dual converters

UNIT–III:

Control of DC motors by DC–DC converters (Type C & Type D)

Single quadrant – Two quadrant and four quadrant chopper fed separately excited and series excited motors – Continuous current operation– Output voltage and current waveforms – Speed–torque expressions – Speed–torque characteristics –Four quadrant operations – Closed loop operation (Block diagrams only).

UNIT–IV:

Induction motor control – Stator side

Variable voltage characteristics–Control of Induction Motor by AC Voltage Controllers – Waveforms –Speed torque characteristics– Variable Voltage Variable Frequency control of induction motor by voltage source inverter –PWM control – Closed loop operation of induction motor drives (Block Diagram Only).

UNIT–V:

Control of Induction motor – Rotor side

Static rotor resistance control – Slip power recovery schemes – Static Scherbius drive – Static Kramer drive – Performance and speed torque characteristics – Advantages –Applications.

UNIT–VI:

Control of Synchronous Motors

Separate control &self control of synchronous motors – Operation of self controlled synchronous motors by VSI– Closed Loop control operation of synchronous motor drives (Block Diagram Only) –Variable frequency control–Pulse width modulation.

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO
COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name:B.Tech Faculty Name: L.SRUJANA

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV B.Tech	I	ELECTRICAL DISTRIBUTION SYSTEMS		11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3hrs	Internal 30M	External 70M	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem** research literature, and analyze complex engineering problems reaching substantiated **analysis** Identify, formulate, conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

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8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
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10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1.To study different factors of Distribution system.

2.To study and design the substations and distribution systems.

3.To study the determination of voltage drop and power loss.

4. To study the distribution system protection and its coordination.

5.To study the effect of compensation on p.f improvement.

6. To study the effect of voltage control on distribution system.

Course Outcomes

1.Able to understand the various factors of distribution system.

2.Able to design the substation and feeders.

3. Able to determine the voltage drop and power loss

4. Able to understand the protection and its coordination.

5. Able to understand the effect of compensation on p.f improvement.

6. Able to understand the effect of voltage, current distribution systemperformance.

UNIT I

General Concepts

Introduction to distribution systems, Load modeling and characteristics –Coincidence factor – Contribution factor loss factor – Relationship betweenthe load factor and loss factor – Classification of loads (Residential, commercial, Agricultural and Industrial) and their characteristics.

UNIT-II

Substations

Location of substations**:** Rating of distribution substation – Service area within primary feeders – Benefits derived through optimal location of substations.

Distribution Feeders

Design Considerations of distribution feeders**:** Radial and loop types of primary feeders – Voltage levels – Feeder loading – Basic design practice of the secondary distribution system.

UNIT-III

System Analysis

Voltage drop and power–loss calculations**:** Derivation for voltage drop andpower loss in lines – Manual methods of solution for radial networks – Three phase balanced primary lines.

UNIT – IV

Protection

Objectives of distribution system protection – Types of common faults and procedure for fault calculations – Protective devices**:** Principle of operation of fuses – Circuit reclosures – Line sectionalizes and circuit breakers.

Coordination

Coordination of protective devices**:** General coordination procedure –Residual current circuit breaker RCCB (Wikipedia).

UNIT-V

Compensation for Power Factor Improvement

Capacitive compensation for power–factor control – Different types of power capacitors – shunt and series capacitors – Effect of shunt capacitors (Fixedand switched) – Power factor correction – Capacitor allocation – Economic justification – Procedure to determine the best capacitor location.

UNIT-VI

Voltage Control

Voltage Control**:** Equipment for voltage control – Effect of series capacitors

– Effect of AVB/AVR –Line drop compensation.

Program Name: B. TECH Faculty Name: RAJESH V

Class	Semester	Title of The Paper	Paper Code	W.E. F
IV YEAR	I	POWER SYSTEM OPERATION AND CONTROL	RT41023	11/06/2018

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
65 Hours	Theory 4	Practical ---	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:**

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:**

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To understand optimal dispatch of generation with and without losses.
2. To study the optimal scheduling of hydro thermal systems.
3. To study the optimal unit commitment problem.
4. To study the load frequency control for single area system
5. To study the PID controllers for single area system and two area system.
6. To understand the reactive power control and compensation of transmission lines.

Course Outcomes:

7. Solve economic load dispatch problem and allocate the load among thermal Plants
8. Solve economic load dispatch problem and allocate the load between thermal and hydro plants.
9. Solve unit commitment problem by using priority listing scheme and dynamic programming methods
10. Design single and two area LFC for thermal power plant.
11. Analyze single area power system by using PI controller.
12. Understand reactive power control and line power compensation.

UNIT-I **Economic Operation of Power Systems**

Optimal operation of Generators in Thermal power stations, – Heat rate curve – Cost Curve – Incremental fuel and Production costs – Input–output characteristics – Optimum generation allocation with line losses neglected – Optimum generation allocation including the effect of transmission line losses – Loss Coefficients – General transmission line loss formula.

UNIT–II: Hydrothermal Scheduling

Optimal scheduling of Hydrothermal System**:** Hydroelectric power plant models – Scheduling problems – Short term Hydrothermal scheduling problem.

UNIT–III: Unit Commitment

Optimal unit commitment problem – Need for unit commitment – Constraints in unit commitment – Cost function formulation – Solution methods – Priority ordering – Dynamic programming.

UNIT–IV: Load Frequency Control

Modeling of steam turbine – Generator – Mathematical modeling of speed governing system – Transfer function – Modeling of Hydro turbine – Necessity of keeping frequency constant – Definitions of Control area – Single area control – Block diagram representation of an isolated power system – Steady state analysis – Dynamic response – Uncontrolled case – Load frequency control of two area system – Uncontrolled case and controlled case – Tie–line bias control.

UNIT–V: Load Frequency Controllers

Proportional plus Integral control of single area and its block diagram representation – Steady state response – Load Frequency Control and Economic dispatch control.

UNIT–VI: Reactive Power Control

Overview of Reactive Power control – Reactive Power compensation in transmission systems – Advantages and disadvantages of different types of compensating equipment for transmission systems – Load compensation – Specifications of load compensator – Uncompensated and compensated transmission lines**:** Shunt and series compensation – Need for FACTS controllers.

Program Name: B.TECH Faculty Name: V.PRAVEEN

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV YEAR	I	ELECTRICAL SIMULAITON LAB		11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
48 Hours	Theory ---	Practical 3		Internal 25	External 50	2

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:**

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:**

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To simulate integrator circuit, differentiator circuit, Boost converter, Buck converter, full convertor and PWM inverter.
2. To simulate transmission line by incorporating line, load and transformer models.
3. To perform transient analysis of RLC circuit and single machine connected to infinite bus(SMIB).

Course Outcomes:

	COURSE OUTCOMES
CO1	Able to determine integrator circuit, differentiator circuit, Boost converter, Buck converter, full convertor and PWM inverter.
CO2	Able to examine transmission line by incorporating line, load and transformer models.

SYLLABUS

1. Simulation of transient response of RLC circuits

a. Response to pulse input

b. Response to step input

c. Response to sinusoidal input

2. Analysis of three phase circuit representing the generator transmission line and load. Plot three phase currents & neutral current.

3. Simulation of single–phase full converter using RLE loads and single phase AC voltage controller using RL loads.

4. Plotting of Bode plots, root locus and nyquist plots for the transfer functions of systems up to 5th order.

5. Power system load flow using Newton–Raphson technique.

6. Simulation of Boost and Buck converters.

7. Integrator & Differentiator circuits using op–amp.

8. Simulation of D.C separately excited motor using transfer function approach.

9. Modeling of transformer and simulation of lossy transmission line.

10. Simulation of single phase inverter with PWM control.

Program Name:B.Tech(EEE) Faculty Name:SAI PALLAVI.A

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	I	INSTRUMENTATION	RT41025	11/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
92 Hours	Theory 6	Practical ---	3Hrs	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem** research literature, and analyze complex engineering problems reaching substantiated **analysis** Identify, formulate, conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To study various types of signals and their representation.
2. To study various types of transducers: Electrical, Mechanical, Electromechanical, Optical etc.
3. To study and measure the various types of Non–electrical quantities.
4. To study various types of digital voltmeters
5. To study the working principles of various types of oscilloscopes and their applications.
6. To study various types of signal analyzers.

Course Outcomes:

	COURSE OUTCOMES	Cognitive Levels
CO1	Interpret various types of signals and their errors.	U(K2)

CO2	Instantiate proper knowledge to use various types of Transducers.	U(K2)
CO3	Analyze various parameters such as strain, velocity, temperature, pressure etc..	Analyze(K4)
CO4	Illustrate working principle of various types of digital voltmeters.	U(K2)
CO5	Discuss various parameter like phase and frequency of a signal with the help of CRO	U(K2)
CO6	Acquire proper knowledge and able to handle various types of signal analyzers	U(K2)

UNIT–I:
Signals and their representation

Measuring Systems, Performance Characteristics, – Static characteristics – Dynamic Characteristics – Errors in Measurement – Gross Errors – Systematic Errors – Statistical analysis of random errors – Signal and their representation – Standard test, periodic, aperiodic, modulated signal – Sampled data pulse modulation and pulse code modulation.

UNIT–II:
Transducers

Definition of transducers – Classification of transducers – Advantages of Electrical transducers – Characteristics and choice of transducers – Principle operation of resistor, inductor, LVDT and capacitor transducers – LVDT Applications – Strain gauge and its principle of operation – Guage factor – Thermistors – Thermocouples – Synchros – Piezo electric transducers –
Photo diodes.

UNIT–III:
Measurement of Non–Electrical Quantities

Measurement of strain – Gauge Sensitivity – Displacement – Velocity – Angular Velocity – Acceleration – Force – Torque – Measurement of Temperature, Pressure, Vacuum, Flow, Liquid level.

UNIT–IV:
Digital Voltmeters

Digital voltmeters – Successive approximation, ramp, dual–Slope integration continuous balance type – Micro processor based ramp type – DVM digital frequency meter – Digital phase angle meter.

UNIT–V:
Oscilloscope

Cathode ray oscilloscope – Time base generator – Horizantal and vertical amplifiers – Measurement of phase and frequency – Lissajous patterns – Sampling oscilloscope – Analog and digital type data loger – Transient recorder.

UNIT–VI:
Signal Analyzers

Wave Analyzers – Frequency selective analyzers – Heterodyne – Application of Wave analyzers – Harmonic Analyzers – Total Harmonic distortion – Spectrum analyzers – Basic spectrum analyzers – Spectral displays – Vector impedance meter – Q meter – Peak reading and RMS voltmeters.

Program Name: B.TECH Faculty Name: V.PRAVEEN

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV YEAR	I	RESS		11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical ---		Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:**

   Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:**

   Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**:

   Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**:

    Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**:

    Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**:

    Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PS01	Specify, architect, design and analyze systems that efficiently generate, transmit, distribute and utilize electrical power
PS02	Analyze and design modern electrical drive systems and modern lighting systems
PS03	Understand the principles and construction of electrical machines and determine their performance through testing
PS04	Specify, design, implement and test analog and embedded signal processing electronic systems using the state of the art components and software tools

Course Objectives:

7. To study the solar radiation data, extraterrestrial radiation, radiation on earth's surface.
8. To study solar thermal collections.
9. To study solar photo voltaic systems.
10. To study maximum power point techniques in solar pv and wind energy.
11. To study wind energy conversion systems, Betz coefficient, tip speed ratio.
12. To study basic principle and working of hydro, tidal, biomass, fuel cell and geothermal systems.

Course Outcomes:

	COURSE OUTCOMES
CO1	Analyze solar radiation data, extraterrestrial radiation, radiation on earth's surface.
CO2	Design solar thermal collections.
CO3	Design solar photo voltaic systems.
CO4	Develop maximum power point techniques in solar PV and wind.
CO5	Explain wind energy conversion systems, Betz coefficient, tip speed ratio.
CO6	Explain basic principle and working of hydro, tidal, biomass, fuel cell and geothermal systems.

SYLLABUS

UNIT–I:

Fundamentals of Energy Systems

Energy conservation principle – Energy scenario (world and India) – Solar radiation**:** Outside earth's atmosphere – Earth surface – Analysis of solar radiation data – Geometry – Radiation on tilted surfaces – Numerical problems.

UNIT–II:

Solar Thermal Systems

Liquid flat plate collections**:** Performance analysis – Transmissivity – Absorptivity product collector efficiency factor – Collector heat removal factor – Numerical problems. Introduction to solar air heaters – Concentrating collectors and solar pond.

UNIT–III:

Solar Photovoltaic Systems

Balance of systems – IV characteristics – System design**:** storage sizing – PV system sizing – Maximum power point techniques**:** Perturb and observe (P&O) technique – Hill climbing technique.

UNIT–IV:

Wind Energy

Wind patterns – Types of turbines – Kinetic energy of wind – Betzcoefficient – Tip–speed ratio – Efficiency – Power output of wind turbine –Selection of generator(synchronous, induction) – Maximum power point tracking.

UNIT–V:

Hydro and Tidal power systems

Basic working principle – Classification of hydro systems**:** Large, small,micro – measurement of head and flow – Energy equation – Types of turbines – Numerical problems.Tidal power – Basics – Kinetic energy equation – Numerical problems –Wave power – Basics – Kinetic energy equation.

UNIT–VI:

Biomass, fuel cells and geothermal systems

Biomass Energy**:** Fuel classification – Pyrolysis – Direct combustion of heat– Different digesters and sizing.

Fuel cell**:** Classification – Efficiency – VI characteristics.

Geothermal**:** Classification – Dry rock and acquifer – Energy analysis.

Program Name: B.TECH(EEE) Faculty Name: Musthak Ahmed Shaik

Class	Semester	Title of The Paper	Paper Code	W.E.F
IVth year	Ist	HVAC & DC TRANSMISSION	RT41022	June-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	4	0	3Hrs	30	70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

1. **PSO1:**:The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.
2. **PSO2:**:The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system
3. **PSO3:**:The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.
4. **PSO4:**:The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- To understand the phenomena associated with transmission line, operating at extra high voltages. The unit gives detail analysis of several phenomena viz. electrostatic field, charges, voltage gradient and conductor configuration.
- The objective is to discuss phenomena of corona, losses, audible noise, radio interference and measurement of these quantities.
- To understand the phenomena of HVDC, HVDC equipment comparison with AC and the latest state of art in HVDC transmission.
- To understand method of conversion of AC to DC, performance of various level of pulse conversion and control characteristics of conversion. It also provides knowledge of effect of source inductance as well as method of power control.
- To understand the requirements of reactive power control and filtering technique in HVDC system.
- To understand the harmonics in AC side of power line in a HVDC system and design of filters for various levels of pulse conversion.

Course Outcomes:

	Course Outcomes	Cognitive Levels
CO1	Explain and analyze the phenomenon associated with transmission line operating at extra high voltages	ANALYSE
CO2	Discuss and measure corona losses, audible noise, radio interference	CREATE
CO3	Distinguish AC/DC transmission, types of DC links, applications Identify major HVDC Technologies the modern trends and technical planning issues associated with HVDC	ANALYSE
CO4	Analyse Grates bridge converter circuit	ANALYSE
CO5	Explain the requirements of reactive power control in HVDC system	UNDERSTAND
CO6	Analyse harmonics and design of AC filters.	ANALYSE

SYLLABUS

UNIT – I

Introduction of EHV AC transmission:

Necessity of EHV AC transmission – Advantages and problems – Power handling capacity and line losses – Mechanical considerations – Resistance of conductors –Electrostatics – Field of sphere gap – Field of line charges and properties – Charge ~ potential relations for multi–conductors – Surface voltage gradient on conductors – Bundle spacing and bundle radius – Examples – Distribution of voltage gradient on sub conductors of bundle – Examples.

UNIT – II

Corona effects:

Power loss and audible noise (AN) – Corona loss formulae – Charge voltage diagram – Generation – Characteristics – Limits and measurements of AN – Relation between 1–phase and 3–phase AN levels – Examples – Radio interference (RI) – Corona pulses generation – Properties and limits – Frequency spectrum – Modes of propagation – Excitation function – Measurement of RI, RIV and excitation functions – Examples.

UNIT – III

Basic Concepts of DC Transmission:

Economics & Terminal equipment of HVDC transmission systems: Types of HVDC Links – Apparatus required for HVDC Systems – Comparison of AC & DC transmission – Application of DC Transmission System – Planning & Modern trends in DC transmission.

UNIT – IV

Analysis of HVDC Converters and System Control:

Choice of Converter configuration – Analysis of Graetz – Characteristics of 6 Pulse & 12 Pulse converters – Cases of two 3 phase converters in star – Star mode and their performance – Principal of DC Link Control – Converters Control Characteristics – Firing angle control – Current and extinction angle control – Effect of source inductance on the system – Starting and stopping of DC link – Power Control.

UNIT–V

Reactive Power Control in HVDC: Reactive Power Requirements in steady state – Conventional control strategies –Alternate control strategies sources of reactive power – AC Filters – Shunt capacitors – Synchronous condensers.

UNIT – VI

Harmonics and Filters:

Generation of Harmonics – Characteristics harmonics – Calculation of AC Harmonics – Non–Characteristics harmonics – Adverse effects of harmonics – Calculation of voltage & current harmonics – Effect of Pulse number on harmonics. Types of AC filters, Design of Single tuned filters – Design of High pass filters.

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY

VIJAYAWADA - 520 001.

Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: III. B.Tech **Faculty Name: T. Sireesha / D. Gowthami**

Class	Semester	Title of The Paper	Paper Code	W.E.F
EEE	IV-I	**MPMC LAB**		

.Total No. of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The main objectives of the course is to impart

- To study programming based on 8086 microprocessor and 8051 microcontroller.
- To study 8086 microprocessor based ALP using arithmetic, logical and shift operations.
- To study to interface 8086 with I/O and other devices.
- To study parallel and serial communication using 8051& PIC 18 micro controllers.

Course Outcomes:

Student able to:

CO1: Will be able to write assembly language program using 8086 micro based on arithmetic, logical, and shift operations.

CO2: Will be able to interface 8086 with I/O and other devices.

CO3: Will be able to do parallel and serial communication using 8051 & PIC 18 micro controllers.

Program Name: B.TECH Faculty Name: K.NARENDRA/V.M/A.S.P

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	II	AI TECHNIQUES		

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	5	---	3	25	50	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:**

   Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:**

   Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**:

   Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**:

    Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**:

    Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**:

    Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To study various methods of AI
2. To study the models and architecture of artificial neural networks.
3. To study the ANN paradigms.
4. To study the fuzzy sets and operations.
5. To study the fuzzy logic systems.
6. To study the applications of AI.

Course Outcomes:

1. Able to study various methods of AI
2. Able to Understand models and architecture of artificial neural networks.
3. Able to Understand the ANN paradigms.
4. Able to understand the fuzzy sets and operations.
5. Able to understand the fuzzy logic systems.
6. Able to apply the applications of AI.

Syllabus of AI TECHNIQUES

UNIT–I:
Introduction to AI techniques
Introduction to artificial intelligence systems– Humans and Computers –Knowledge representation – Learning process – Learning tasks – Methods of AI techniques.

UNIT–II:
Neural Networks
Organization of the Brain – Biological Neuron – Biological and Artificial neuron Models, MC Culloch-pitts neuron model, Activation functions, Learning rules, neural network architectures- Single-layer feed-forward networks: – Perceptron, Learning algorithm for perceptron- limitations of Perceptron model

UNIT–III:
ANN paradigm
Multi-layer feed-forward network (based on Back propagation algorithm)–Radial-basisn function networks- Recurrent networks (Hopfield networks).

UNIT – IV:
Classical and Fuzzy Sets
Introduction to classical sets – properties – Operations and relations – Fuzzy sets – Membership – Uncertainty – Operations – Properties – Fuzzy relations – Cardinalities – Membership functions.

UNIT–V:
Fuzzy Logic System Components
Fuzzification – Membership value assignmen – Development of rule base and decision making system – Defuzzification to crisp sets – Defuzzification methods – Basic hybrid system.

UNIT–VI:
Application of AI techniques
Load forecasting – Load flow studies – Economic load dispatch – Load frequency control – Reactive power control – Speed control of dc and ac motors.

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Program Name: B.TECH (EEE) Faculty Name: Musthak Ahmed Shaik

Class	Semester	Title of The Paper	Paper Code	W.E.F
IVth year	IInd	DIGITAL CONTROL SYSTEM	RT42021	19-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical 0	3Hrs	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

1. **PSO1:**:The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.
2. **PSO2:**:The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system
3. **PSO3:**:The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.
4. **PSO4:**:The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- To understand the concepts of digital control systems and assemble various components associated with it. Advantages compared to the analog type.
- The theory of z–transformations and application for the mathematical analysis of digital control systems.
- To represent the discrete–time systems in state–space model and evaluation of state transition matrix.
- To examine the stability of the system using different tests.
- To study the conventional method of analyzing digital control systems in the w–plane.
- To study the design of state feedback control by "the pole placement method."

Course Outcomes:

	COURSE OUTCOMES	Cognitive Levels
CO1	Able to learn the advantages of discrete time control systems and the "know how" of various associated accessories.	Understand
CO2	Able to understand z–transformations and their role in the mathematical analysis of different systems(like laplace transforms in analog systems).	Analyse
CO3	Able to explain the conventional and state–space methods of design.	Evaluate
CO4	Able to explain the stability criterion for digital systems and methods adopted for testing	Analyse
CO5	Able to analyse digital control systems in w-plane and understand various analytical methods	Evaluate
CO6	Able to design feedback controllers	Create

SYLLABUS

UNIT – I

Introduction and signal processing Introduction to analog and digital control systems – Advantages of digital systems – Typical examples – Signals and processing – Sample and hold devices – Sampling theorem and data reconstruction – Frequency domain characteristics of zero order hold.

UNIT–II

Z–transformations Z–Transforms – Theorems – Finding inverse z–transforms – Formulation of difference equations and solving – Block diagram representation – Pulse transfer functions and finding open loop and closed loop responses.

UNIT–III

State space analysis and the concepts of Controllability and observability State Space Representation of discrete time systems – State transition matrix and methods of evaluation – Discretization of continuous – Time state equations – Concepts of controllability and observability – Tests (without proof).

UNIT – IV

Stability analysis Mapping between the S–Plane and the Z–Plane – Primary strips and Complementary Strips – Stability criterion – Modified routh's stability criterion and jury's stability test.

UNIT – V

Design of discrete–time control systems by conventional methods Transient and steady state specifications – Design using frequency response in the w–plane for lag and led compensators – Root locus technique in the z– plane.

UNIT – VI

State feedback controllers: Design of state feedback controller through pole placement – Necessary and sufficient conditions – Ackerman's formula.

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Program Name: B.TECH   Faculty Name: V.PRAVEEN

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	II	FACTS		

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	5	----	3	30	70	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:**

   Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

   Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:**

   Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:**

   Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**:

   Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**:

    Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**:

    Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**:

    Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes [PSOs]:

PSO1::The EEE Graduates will be able to Design, analyze, operate and test various Electrical Machines.

PSO2::The EEE Graduates will be able to Describe and analyze the operation and control of power systems and also along with simulation, conduct load flow studies on given power system

PSO3::The EEE Graduates will be able to Explain and operate various electronics/power electronic devices/system along with conducting simulation studies on them.

PSO4::The EEE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To learn the basics of power flow control in transmission lines using FACTS controllers
2. To explain operation and control of voltage source converter.
3. To understand compensation methods to improve stability and reduce power oscillations of a power system.
4. To learn the method of shunt compensation using static VAR compensators.
5. To learn the methods of compensation using series compensators
6. To explain operation of Unified Power Flow Controller (UPFC).

Course Outcomes:

1. Understandpower flow control in transmission lines using FACTS controllers.
2. Explain operation and control of voltage source converter.
3. Analyze compensation methods to improve stability and reduce power oscillations in the transmission lines.
4. Explain the method of shunt compensation using static VAR compensators.
5. Understand the methods of compensations using series compensators.
6. Explain operation of Unified Power Flow Controller (UPFC).

SYLLABUS OF FACTS

Unit–I:
Introduction to FACTS
Power flow in an AC System – Loading capability limits – Dynamic stability considerations – Importance of controllable parameters – Basic types of FACTS controllers – Benefits from FACTS controllers – Requirements and characteristics of high power devices – Voltage and current rating – Losses and speed of switching – Parameter trade–off devices.

Unit–II:
Voltage source and Current source converters
Concept of voltage source converter(VSC) – Single phase bridge converter – Square–wave voltage harmonics for a single–phase bridge converter – Three–phase full wave bridge converter– Three–phase current source converter – Comparison of current source converter with voltage source converter.

Unit–III:
Shunt Compensators–1
Objectives of shunt compensation – Mid–point voltage regulation for line segmentation – End of line voltage support to prevent voltage instability – Improvement of transient stability – Power oscillation damping.

Unit–IV:
Shunt Compensators–2
Thyristor Switched Capacitor(TSC)–Thyristor Switched Capacitor – Thyristor Switched Reactor (TSC–TCR). Static VAR compensator(SVC) and Static Compensator(STATCOM)**:** The regulation and slope transfer function and dynamic performance – Transient stability enhancement and power oscillation damping– Operating point control and summary of compensation control.

Unit V:
Series Compensators

Static series compensators**:** Concept of series capacitive compensation – Improvement of transient stability – Power oscillation damping – Functional requirements. GTO thyristor controlled Series Capacitor (GSC) – Thyristor Switched Series Capacitor (TSSC) and Thyristor Controlled Series Capacitor (TCSC).

Unit–VI:

Combined Controllers

Schematic and basic operating principles of Unified Power Flow Controller (UPFC).– Application on transmission lines.

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Program Name: I. B.Tech **Faculty Name:** Sri.T.Santhi Sree

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I	**ENGLISH-I**	**R161101**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To improve the language proficiency of the students in English with emphasis on LSRW skills.
2. To enable the students to study and comprehend the prescribed lessons and subjects more effectively relating
to their theoretical and practical components.
3. To develop the communication skills of the students in both formal and informal situations.

Course Outcomes:

Student able to:

CO1: Summarize how self introspection brings harmony and satisfaction. (K2)
CO2: Develop scientific attitude to solve many problems which we find difficult to tackle. (K3)
CO3: Analyze clearly and logically and write clearly and logically. (K4)
CO4: Agree that all men can come together and avert the peril. (K5)
CO5: Outline the formation of the planet and realize our place in the universe. (K2)
CO6: Develop humor and the use of words for irony. (K3)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	2
CO2 [K3]	-	1	-	-	2	-	-	-	1	-	-	-	-	-	-	3
CO3 [K4]	-	-	-	-	-	-	-	3	1	-	1	-	-	-	-	3
CO4 [K5]	-	-	-	-	-	-	3	3	1	-	-	-	-	-	-	3
CO5 [K2]	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2
CO6 [K3]	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	3

Program Name: I. B.Tech **Faculty Name:** Sri.J.A.V.Ravindra Babu

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I	**MATHEMATICS-I**	**R161102**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. The course is designed to equip the students with the necessary mathematical skills and techniques that are essential for an engineering course.
2. The skills derived from the course will help the student from a necessary base to develop analytic and design concepts.

Course Outcomes:
Student able to:

CO1: Classify differential equations by order linearity and homogeneity. (K2)
CO2: Solve linear equations with constant coefficients. (K3)
CO3: solve differential equations using Laplace transforms and inverses Laplace transforms. (K3)
CO4: Estimate the Maximum and Minimum of the function of two variables. (K5)
CO5: Solve linear partial differential equations of both first and second order. (K3)
CO6: solve linear second order PDEs by separation of variables, with applications to the wave, diffusion and Laplace's equations. (K3)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	1	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO2 [K3]	2	3	-	-	-	-	-	-	-	-	-	2	-	-	-	-
CO3 [K3]	-	-	1	2	-	-	-	-	-	-	-	-	-	-	2	-
CO4 [K5]	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-
CO5 [K3]	2	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO6 [K3]	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-

Program Name: I. B.Tech **Faculty Name:** Sri.K.Bhanu Chander

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I	**MATHEMATICS-II**	**R161110**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. The course is designed to equip the students with the necessary mathematical skills and techniques that are essential for an engineering course.
2. The skills derived from the course will help the student from a necessary base to develop analytic and design concepts.

Course Outcomes:

Student able to:

CO1: Solve algebraic or transcendental equation in a simple manner. (K6)
CO2: Construct new data points within the range of a discrete set of known data points. (K6)
CO3: Solve differential equations by numerically. (K6)
CO4: Decompose any periodic function or periodic signal into the sum of a (possibly infinite) set of simple oscillating functions, namely sine's and cosines (or complex exponentials) (K5)
CO5: Decompose a function of time (a signal) into the frequencies that make it up. (K5)
CO6: To solve the difference equations. (K6)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K6]	1	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO2 [K6]	2	3	-	-	-	-	-	-	-	-	-	2	-	-	-	-
CO3 [K6]	-	-	1	2	-	-	-	-	-	-	-	-	-	-	2	-
CO4 [K5]	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-
CO5 [K5]	2	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO6 [K6]	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-

Program Name: I. B.Tech **Faculty Name:** Sri.P.Naresh

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I	**ENGINEERING PHYSICS**	**R161104**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The courses are designed to:

- Impart Knowledge of Physical Optics phenomena like Interference, Diffraction and Polarization involving required to design instruments with higher resolution.
- Teach Concepts of coherent sources, its realization and utility optical instrumentation.
- Study the concepts regarding the bulk response of materials to the EM fields and their analytically study in the back-drop of basic quantum mechanics.
- Understand the physics of Semiconductors and their working mechanism for their utility in sensors.

Course Outcomes:

Student able to:

CO1: Classify and explain the concepts of principles of superposition, Interference, Diffraction and polarization (K2)

CO2: Explain the concepts of production of lasers, wave propagation in optical fibers, structures of crystals and XRD technique (K5)

CO3: Analyze properties of Magnetic, Dielectric, Superconductivity and applications of the devices in different fields in engineering (K4)

CO4: List out the Absorption coefficients of materials and explain the Fundamental laws of electromagnetism and Maxwell's Electromagnetic (K4)

CO5: Explain the properties and theories of matter waves in Quantum levels and Classify the materials into conductors, semi – conductors & insulators (K5)

CO6: Explain the properties of semiconductors and Mechanisms of LEDs, Photo conductors and solar cells by minimizing the environmental pollution. (K5)

POs' / **COs'**	**PO1 [k3]**	**PO2 [k4]**	**PO3 [k5]**	**PO4 [K5]**	**PO5 [K3]**	**PO6 [K3]**	**PO7 [K3]**	**PO8 [K3]**	**PO9 [K6]**	**PO10 [K2]**	**PO11 [K6]**	**PO12 [K1]**	**PSO1 [K3]**	**PSO2 [K3]**	**PSO3 [K3]**	**PSO4 [K2]**
CO1 [K2]	1	1		-	-	-	-	-	-	-	-	-	-	-	-	-
CO2 [K5]	3	3		-	-	-	-	-	-	-	-	-	-	-	-	-
CO3 [K4]	3	2		-	-	-	-	-	-	-	-	-	-	-	-	-
CO4 [K4]	3	2		-	-	-	-	-	-	-	-	-	-	-	-	-
CO5 [K5]	3	3		-	-	-	-	-	-	-	-	-	-	-	-	-
CO6 [K5]	3	3		-	-	-	-	-	-	-	-	-	-	-	-	-

Program Name: I. B.Tech **Faculty Name:** Sri.M.Udaya Tejaswini

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I-I	**COMPUTER PROGRAMMING**	**R161107**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- Formulating algorithmic solutions to problems and implementing algorithms in C.
- Notion of Operation of a CPU, Notion of an algorithm and computational procedure, editing and executing Programs in Linux.
- Understanding branching, iteration and data representation using arrays.
- Modular programming and recursive solution formulation.

- Understanding pointers and dynamic memory allocation.
- Understanding miscellaneous aspects of C.
- Comprehension of file operations.

Course Outcomes:

Student able to:

CO1: Design algorithms using fundamentals concepts of computer system Using different data types, operators and standard library functions. (K6)

CO2: Design applications involving the control flow statements. (K6)

CO3: Design a case study involving modular programming. (K6)

CO4: Design application involving arrays and strings. (K6)

CO5: Design applications using structures, unions, pointers. (K6)

CO6: Design applications using file system concepts. (K6)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K6]	3	3	3	-	-	-	-	3	3	3	2	3	3	3	3	3
CO2 [K6]	3	3	3	3	-	-	-	3	3	3	2	3	3	3	3	3
CO3 [K6]	3	3	3	3	-	-	-	3	3	3	2	2	3	3	3	3
CO4 [K6]	3	3	3	3	-	-	-	3	3	3	2	3	3	3	3	3
CO5 [K6]	3	3	3	3	-	-	-	3	3	3	2	3	3	3	3	3
CO6 [K6]	3	3	3	3	-	-	-	3	3	3	2	3	3	3	3	3

Program Name: I. B.Tech **Faculty Name:** R.Rajesh/D.Prasad

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I-II	**ELECTRICAL AND MECHANICAL TECHNOLOGY**	**R161214**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To learn the basic principles of electrical law's and analysis of networks.
2. To understand the principle of operation and construction details of DC machines.
3. To understand the principle of operation and construction details of transformer.
4. To understand the principle of operation and construction details of alternator and 3-Phase induction motor.
5. To Understand the principles and construction of various measuring instruments.

Course Outcomes:

Student able to:

CO1: Determine resultants of different force systems. (K5)
CO2: Apply conditions of static equilibrium to plane force systems. (K3)
CO3: Determine centroid and center of gravity of composite bodies. (K5)
CO4: Determine Moment of inertia and Mass moment of inertia of composite Bodies. (K5)
CO5: Solve problems in kinematic and dynamic systems. (K6)
CO6: Calculate work, energy for different systems. (K1)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K5]	3	3	-	-	-	-	-	-	-	-	-	-	3	-	-	-
CO2 [K3]	2	1	-	-	-	-	-	-	-	-	-	-	2	-	-	-
CO3 [K5]	3	3	-	-	-	-	-	-	-	-	-	-	3	-	-	-
CO4 [K5]	3	3	-	-	-	-	-	-	-	-	-	-	3	-	-	-
CO5 [K6]	3	3	-	-	-	-	-	-	-	-	-	-	3	-	-	-
CO6 [K1]	1	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-

Program Name: I. B.Tech **Faculty Name:** Sri.K.Surendra Babu

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I	**ENGINEERING DRAWING**	**R161113**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. Engineering drawing being the principle method of communication for engineers, the objective is to introduce the students, the techniques of constructing the various types of polygons, curves and scales.
2. The Objective is also to visualize and represent the 3D objects in 2D planes with proper dimensioning, scaling etc.

Course Outcomes:
Student able to:

CO1: Construct the polygons, curves and various types of scales.(K3)
CO2: Project the points and lines parallel to one plane and inclined to other. (K3)
CO3: Draw the projections of the lines inclined to both the planes. (K5)
CO4: Draw the projections of the plane inclined to both the planes. (K5)
CO5: Draw the projections of the various types of solids in different positions inclined to one of the planes. (K5)
CO6: Convert the isometric view to orthographic view and vice versa. (K6)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K3]	-	-	-	-	2	-	-	-	-	-	-	-	-	-	2	-
CO2 [K3]	-	-	-	-	2	-	-	-	-	-	-	-	-	-	2	-
CO3 [K5]	-	-	-	-	2	-	-	-	-	-	-	-	-	-	3	-
CO4 [K5]	-	-	-	-	2	-	-	-	-	-	-	-	-	-	3	-
CO5 [K5]	-	-	-	-	2	-	-	-	-	-	-	-	-	-	3	-
CO6 [K6]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-

Program Name: I. B.Tech **Faculty Name:** T.Santhi Sree

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I-II	**ENGLISH-II**	**R161201**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

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PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To improve the language proficiency of the students in English with emphasis on LSRW skills.
2. To enable the students to study and comprehend the prescribed lessons and subjects more effectively relating
to their theoretical and practical components.
3. To develop the communication skills of the students in both formal and informal situations.

Course Outcomes:

Student able to:

CO1: Interpret that technology should help solve the problems of common man.(K2)

CO2: Summarize that climate must be preserved. (K2)

CO3: Apply emerging technologies such as nanotechnology for the betterment of human life. (K3)

CO4: Outlinethat water is the elixir of life and try to conserve it. (K2)

CO5: Develop the attitude of devotion and dedication to hard work to succeed in life. (K6)

CO6: Solve personal problems and prioritize national problems. (K6)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	1	1	-	-	1	-	1	1	1	-	1	3	-	-	-	2
CO2 [K2]	-	-	-	-	1	-	1	-	1	-	-	-	-	-	-	3
CO3 [K3]	2	-	-	-	2	-	-	-	1	-	1	3	-	-	-	3
CO4 [K2]	-	-	-	-	-	-	1	-	1	-	1	-	-	-	-	3
CO5 [K6]	-	-	-	-	-	-	3	3	2	-	-	-	-	-	-	2
CO6 [K6]	3	-	-	-	-	-	3	3	2	-	-	3	-	-	-	3

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: I. B.Tech **Faculty Name:** Dr.K.Surya Kumari

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I-II	**ENVIRONMENTAL STUDIES**	**R161212**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- The objectives of the course is to impart
- Overall understanding of the natural resources
- Basic understanding of the ecosystem and its diversity
- Acquaintance on various environmental challenges induced due to unplanned anthropogenic activities
- An understanding of the environmental impact of developmental activities

- Awareness on the social issues, environmental legislation and global treaties

Course Outcomes:

Student able to:

CO1: Classify various environmental challenges induced due to unplanned anthropogenic activities. To provide basic knowledge on ecosystems; its diversity and protection methods. Role of food webs and food chains in an ecosystem.**(K2)**

CO2: Illustrate natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources**(K2)**

CO3: Illustratethe biodiversity of India and the threats to biodiversity and conservation practices to protect the biodiversity**(K2)**

CO4: Explain the role of individual in minimizing pollution and management of wastes. **(K2)**

CO5: Explain the knowledge of environmental legislation and urban related problems**(K2)**

CO6: Explain the knowledge of environmental management and green concepts. **(K2)**

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	1	1	1	-	1	1	1	1	1	-	-	-	-	-	-	-
CO2 [K2]	1	1	1	-	1	1	1	1	1	2	-	-	-	-	-	-
CO3 [K2]	1	1	1	-	1	1	1	1	1	2	1	-	-	-	-	-
CO4 [K2]	1	1	1	1	1	1	-	1	1	2	-	-	-	-	-	-
CO5 [K2]	1	1	1	1	1	1	-	1	1	2	-	-	-	-	-	-
CO6 [K2]	1	1	1	1	1	1	1	1	1	2	1	3	-	-	-	-

Program Name: I. B.Tech **Faculty Name:** D.Ratna Babu

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I-II	**MATHEMATICS-III**	**R13202**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. The course is designed to equip the students with the necessary mathematical skills and techniques that are essential for an engineering course.
2. The skills derived from the course will help the student from a necessary base to develop analytic and design concepts.
3. Understand the most basic numerical methods to solve simultaneous linear equations

Course Outcomes:

Student able to:

CO1: Acquire knowledge about rank, solve the system of linear equations and apply to electric circuits.(K1)

CO2: Infer the properties of Eigen values and Eigen vectors & apply in free vibration of a two-mass system. Acquire knowledge about Cayley-Hamilton theorem & its applications, quadratic forms and reduction to normal forms. (K2)

CO3: Evaluate double and triple integrals to find area, volume, mass and moment of inertia of plane and solid region. Acquire knowledge about application of integral to lengths, volumes and surface areas of revolution. (K5)

CO4: Acquire knowledge about Gamma and Beta function and to evaluate improper integrals by using Beta & Gamma. (K1)

CO5: Acquire knowledge of gradient, divergence, curl and the various applications of it. (K1)

CO6: Acquire knowledge about line, surface & volume integrals and apply to find work done and understand the vector integral theorems by related problems. (K1)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K1]	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
CO2 [K2]	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
CO3 [K5]	3	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4 [K1]	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
CO5 [K1]	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
CO6 [K1]	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-

Program Name: I. B.Tech **Faculty Name:** M.Udaya Tejaswini

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I-II	**DATA STRUCTURES**	**R161213**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To be familiar with basic techniques handling problems with Data structures
2. Solve problems using data structures such as linear lists, stacks, queues, hash tables

Course Outcomes:

Student able to:

CO1: Illustrate the Basic data structure of arrays and their applications.(K3)
CO2: Illustrate the basic data structure of stacks and queues and their applications.(K2)
CO3: Illustrate the basic data structure of linked list.(K3)
CO4: Implementing data structures like trees and compare their Performance.(K2)
CO5: Implementing data structures like graphs and compare their performance.(K3)
CO6: Apply Algorithm for solving problems like sorting, insertion and deletion of data.(K3)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K3]	1	1	1	1	1	1	1	-	1	2	1	3	-	-	-	2
CO2 [K2]	1	1	1	1	1	1	1	-	1	2	1	3	-	-	-	2
CO3 [K3]	1	1	1	1	1	1	1	-	1	2	1	3	-	-	-	2
CO4 [K2]	2	1	1	1	2	2	2	-	1	3	1	3	-	-	-	3
CO5 [K3]	2	1	1	1	2	2	2	-	1	3	1	3	-	-	-	3
CO6 [K3]	2	1	1	1	2	2	2	-	1	3	1	3	-	-	-	3

Program Name: I. B.Tech **Faculty Name:** G.Anuradha

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I-II	**APPLIED CHEMISTRY**	**R161211**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- Plastics are nowadays used in household appliances; also they are used as composites (FRP) in aerospace Industries (Unit I).
- Fuels as a source of energy are a basic need of any industry, particularly industries like thermal power stations, steel industry, fertilizer industry etc., and hence they are introduced (Unit II).
- The basics for the construction of galvanic cells as well as some of the sensors used in instruments are introduced. Also if corrosion is to be controlled, one has to understand the mechanism of corrosion which itself is explained by electrochemical theory (Unit III).

- With the increase in demand, a wide variety of materials are coming up; some of them have excellent engineering properties and a few of these materials are introduced (Unit IV).
- Understanding of crystal structures will help to understand the conductivity, semiconductors and superconductors. Magnetic properties are also studied (Unit V).
- With the increase in demand for power and also with depleting sources of fossil fuels, the demand for alternative sources of fuels is increasing. Some of the prospective fuel sources are introduced (Unit VI).

Course Outcomes:

Student able to:

CO1: Appraise the quality and utility of suitable water for industrial as well as domestic applications.(K5)

CO2: Extrapolate the knowledge of cell, electrode, cathode, anode, electrolysis, electromotive force, reference electrode and batteries in chemical and other engineering areas. (K2)

CO3: Identify and evaluate different factors influencing corrosion and protection methods. (K3)

CO4: Substantiate the utility of polymers in chemical and hardware industries. **Inculcate** knowledge of basic construction materials with its vital role. (K2)

CO5: Extrapolate the application of fuels in day to day life and
To understand energy–related problems and solve them. (K2)

CO6: Explore the engineering applications of polymeric materials, cement, nano materials, liquid crystals, pv cells etc and Familiar with principle application of green chemistry and green synthesis. (K2)

POs' / **COs'**	**PO1 [k3]**	**PO2 [k4]**	**PO3 [k5]**	**PO4 [K5]**	**PO5 [K3]**	**PO6 [K3]**	**PO7 [K3]**	**PO8 [K3]**	**PO9 [K6]**	**PO10 [K2]**	**PO11 [K6]**	**PO12 [K1]**	**PSO1 [K3]**	**PSO2 [K3]**	**PSO3 [K3]**	**PSO4 [K2]**
CO1 [K5]	3	3	-	2	3	-	-	-	-	-	1	3	-	-	-	-
CO2 [K2]	1	1	-	1	1	-	-	-	-	-	1	3	-	-	-	-
CO3 [K3]	2	1	-	1	2	-	-	-	-	-	1	3	-	-	-	-
CO4 [K2]	1	1	1	1	1	-	-	-	-	-	1	3	-	-	-	-
CO5 [K2]	1	1	1	1	1	1	-	-	-	-	1	3	-	-	-	-
CO6 [K2]	1	1	1	1	1	1	1	-	-	-	1	3	-	-	-	-

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: I. B.Tech **Faculty Name:** Sri.T.Santhi Sree

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I	**ENGLISH COMMUNICATION SKILLS LAB-1**	**R161114**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

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Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

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PO12: Life-long learning:

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Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

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PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

To enable the students to learn through practice the communication skills of listening, speaking, reading and writing.

Course Outcomes:

Student able to:

CO1: Relate himself with G.D .Naidu to become successful entrepreneurs. (K2)

CO2: How grit and determination can take a common man to heights(K1)

CO3: Apply interest in multiple fields of knowledge and social service to make life worthy. (K3)

CO4: Invent new things by emulating Vijay Bhatkar. (K6)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	-	-	1	-	-	1	1	1	1	2	1	1	-	-	-	2
CO2 [K1]	-	-	-	-	-	-	-	1	1	1	1	-	-	-	-	1
CO3 [K3]	-	-	-	-	-	-	-	2	1	3	-	-	-	-	-	3
CO4 [K6]	3	3	-	-	-	3	-	3	2	3	2	-	-	-	-	3

Program Name: I. B.Tech **Faculty Name:** Sri.P.Naresh

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I	**ENGINEERING PHYSICS LAB**	**R161115**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

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PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to:

Training field oriented Engineering graduates to handle instruments and their design methods to improve the accuracy of measurements.

Course Outcomes:

CO1: Illustrate the concepts of principles of superposition, Interference and Diffraction. (K2)
CO2: Explain the concepts of finding acceleration due to gravity, radius of gyration and rigidity modulus, velocity of sound in air. (K5)
CO3: Compare the characteristics of electronic devices P-N semiconductor diode & Zener diode and applications of the devices in different fields in engineering (K5)
CO4: Find the experimental values and compare with their standard values. (K1)
CO5: Extend the results to recent developments (K2)
CO6: Examine the basics of physics in engineering field. (K4)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
CO2 [K5]	3	3	-	-	3	-	-	-	-	-	-	-	-	-	-	-
CO3 [K5]	3	3	-	-	3	-	-	-	-	-	-	-	-	-	-	-
CO4 [K1]	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
CO5 [K2]	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
CO6 [K4]	3	2	-	-	3	-	-	-	-	-	-	-	-	-	-	-

Program Name: I. B.Tech **Faculty Name:** Sri.P.Naresh

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I	**ENGINEERING PHYSICS VERTUAL LABS ASSIGNMENTS**	**R161115**	18-06-2018

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Training Engineering students to prepare a technical document and Improving their writing skills.

Course Outcomes:

Student able to:

CO1:	Explain the concepts and principles (K5)
CO2:	Verify the relations of magnetic properties (K5)
CO3:	Identify the applications of the devices in different fields (K3)
CO4:	Find the experimental values and compare with their standard values. (K1)
CO5:	Extend the results to recent developments (K2)
CO6:	Examine the basics of physics in engineering field. (K4)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K5]	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
CO2 [K5]	3	3	-	-	3	-	-	-	-	-	-	-	-	-	-	-
CO3 [K3]	3	3	-	-	3	-	-	-	-	-	-	-	-	-	-	-
CO4 [K1]	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
CO5 [K2]	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
CO6 [K4]	3	2	-	-	3	-	-	-	-	-	-	-	-	-	-	-

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VIJAYAWADA - 520 001.
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Program Name: I. B.Tech **Faculty Name:** M.Udaya Tejaswini

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I-II	**COMPUTER PROGRAMMING LAB**	**R161228**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. Understand the basic concept of C Programming, and its different modules that includes conditional and looping expressions, Arrays, Strings, Functions, Pointers, Structures and File programming.
2. Acquire knowledge about the basic concept of writing a program.

3. Role of constants, variables, identifiers, operators, type conversion and other building blocks of C Language.
4. Use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.
5. Role of Functions involving the idea of modularity.

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Course Outcomes:

Student able to:

CO1: Design algorithms using fundamental concepts of computer system.(K6)

CO2: Construct programs in C language Using different data types ,operators and standard library functions.(K6)

CO3: Design applications involving the control flow statements.(K6)

CO4: Design a case study involving modular programming.(K6)

CO5: Design application involving arrays and strings.(K6)

CO6: Design applications using structures, unions, pointers and file system concepts.(K6)

POs' / COs'	**PO1 [k3]**	**PO2 [k4]**	**PO3 [k5]**	**PO4 [K5]**	**PO5 [K3]**	**PO6 [K3]**	**PO7 [K3]**	**PO8 [K3]**	**PO9 [K6]**	**PO10 [K2]**	**PO11 [K6]**	**PO12 [K1]**	**PSO1 [K3]**	**PSO2 [K3]**	**PSO3 [K3]**	**PSO4 [K2]**
CO1 [K6]	3	3	3	-	-	-	-	3	2	3	2	3	3	3	3	3
CO2 [K6]	3	3	3	3	-	-	-	3	2	3	2	3	3	3	3	3
CO3 [K6]	3	3	3	3	-	-	-	3	2	3	2	2	3	3	3	3
CO4 [K6]	3	3	3	3	-	-	-	3	2	3	2	3	3	3	3	3
CO5 [K6]	3	3	3	3	-	-	-	3	2	3	2	3	3	3	3	3
CO6 [K6]	3	3	3	3	-	-	-	3	2	3	2	3	3	3	3	3

Program Name: I. B.Tech **Faculty Name:** Sri.N.V.Malavika

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I	**ENGINEERING WORKSHOP&IT WORKSHOP**	**R161117**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. Understand the basic components and peripherals of a computer.
2. To become familiar in configuring a system.
3. Learn the usage of productivity tools002E
4. Acquire knowledge about the netiquette and cyber hygiene.
5. Get hands on experience in trouble shooting a system?

Course Outcomes:

Student able to:

CO1: Prepare the simple jobs as per specification using carpentry tools.**(K3)**
CO2: Prepare the simple jobs as per specification using fitting tools. **(K3)**
CO3: Prepare the simple jobs as per specification using tin smithy tools. **(K3)**
CO4: Make simple connections as per specifications given. **(K6)**
CO5: Infer different types of hardware devices, operating systems and software tools through practical exposure. **(K2)**
CO6: Illustrate various tables using word and excel and develop different types of charts by analyzing the data given in the tables. **(K2)**

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K5]	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2 [K5]	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3 [K3]	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4 [K1]	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5 [K2]	1	1	1	1	-	-	-	1	1	-	-	3	1	1	1	2
CO6 [K4]	3	2	1	1	-	-	-	3	1	-	-	3	3	3	3	3

Program Name: I. B.Tech **Faculty Name:** T.Santhi Sree

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I-II	**ENGLISH COMMUNICATION SKILLS LAB-2**	**R161221**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

To enable the students to learn demonstratively the communication skills of listening, speaking, reading and writing.

Course Outcomes:

Student able to:

CO1: Infer different components of non-verbal communication.(K2)
CO2: Develop communication skills including soft skills. (K6)
CO3: Infer how to participate in GDs and interviews. (K2)
CO4: Improve Presentation skills. (K6)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	1
CO2 [K6]	-	-	-	-	-	-	-	-	2	3	-	-	-	-	-	1
CO3 [K2]	-	-	-	-	-	-	-	1	1	2	-	-	-	-	-	1
CO4 [K6]	-	-	-	-	-	-	-	-	2	3	-	-	-	-	-	1

Program Name: I. B.Tech **Faculty Name:** G.Anuradha

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I-II	**APPLIED CHEMISTRY LAB**	**R161227**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

1. The students entering into the professional course have practically very little exposure to lab classes.
2. The experiments introduce volumetric analysis; redox titrations with different indicators; EDTA titrations;

3. Then they are exposed to a few instrumental methods of chemical analysis. Thus at the end of the lab course,
4. The student is exposed to different methods of chemical analysis and use of some commonly employed instruments. They thus acquire some experimental skills.

Course Outcomes:

Student able to:

CO1: Develop knowledge on analysis with basic concepts of molarity, normality, molality, mole fractions. (K6)
CO2: Determine the quality of food and water using neutralization titration. (K5)
CO3: Appraise the quality of a product or water using complexometric titration. (K5)
CO4: Determine the quantity of ions in the sample using precipitation titration. (K5)
CO5: Analyze pH of the given samples. (K4)
CO6: Estimate quality of food and water based on conductivity and potential samples. (K6)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K6]	3	-	-	3	3	-	-	-	-	-	-	3	-	-	-	-
CO2 [K5]	3	3	2	2	3	3	-	-	-	-	-	3	-	-	-	-
CO3 [K5]	3	3	2	2	3	3	-	-	-	-	-	3	-	-	-	-
CO4 [K5]	3	3	2	2	3	3	-	-	-	-	-	3	-	-	-	-
CO5 [K4]	3	3	1	1	3	3	-	-	-	-	1	3	-	-	-	-
CO6 [K6]	3	3	3	3	3	3	-	-	-	-	2	3	-	-	-	-

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COLLEGE OF ENGINEERING & TECHNOLOGY
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Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: II. B.Tech **Faculty Name: T. Sireesha**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-I	**ELECTRONIC DEVICES AND CIRCUITS**	**R1621041**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- The basic concepts of semiconductor physics are to be reviewed.
- Study the physical phenomena such as conduction, transport mechanism and electrical characteristics of different diodes.
- The application of diodes as rectifiers with their operation and characteristics with and without filters are discussed.

- The principal of working and operation of Bipolar Junction Transistor and Field Effect Transistor and their Characteristics are explained.
- The need of transistor biasing and its significance is explained. The quiescent point or operating point is explained.
- Small signal equivalent circuit analysis of BJT and FET transistor amplifiers in different configuration is explained.

Course Outcomes:

Student able to:

CO1: Illustrate the basic concepts of semiconductor physics.**(K2)**

CO2: Explain the operation of semiconductor diode and special diodes.**(K2)**

CO3: Analyze the operation of rectifiers with and without filters. .**(K4)**

CO4: Illustrate the operation, characteristics, current flow and configurations of BJTs and FETs. .**(K2)**

CO5: Analyze Transistor and FET biasing methods and Thermal stabilization. .**(K4)**

CO6: Analyze small signal low frequency transistor amplifier circuits using BJT & FET in different configurations. .**(K4)**

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2 [K2]	1	1	1	1	-	-	-	-	-	-	-	-	1	-	1	2
CO3 [K4]	1	1	1	1	-	-	-	-	-	-	-	-	1	--	1	2
CO4 [K2]	2	1	1	1	-	-	-	-	-	-	-	-	2	-	-	1
CO5 [K4]	2	1	1	1	-	-	-	-	-	-	-	-	2	-	2	1
CO6 [K4]	2	1	1	1	-	-	-	-	-	-	-	-	2	-	2	1

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VIJAYAWADA - 520 001.
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Program Name: II. B.Tech **Faculty Name: U. Ravi Kiran**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-I	MEFA	**R1621026**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

- The Learning objectives of this paper is to understand the concept and nature of Managerial Economics and its relationship with other disciplines and also to understand the Concept of Demand and Demand forecasting, Production function, Input Output relationship, Cost-Output relationship and Cost-Volume-Profit Analysis.
- To understand the nature of markets, Methods of Pricing in the different market structures and to know the different forms of Business organization and the concept of Business Cycles.

- To learn different Accounting Systems, preparation of Financial Statement and uses of different tools for performance evaluation. Finally, it is also to understand the concept of Capital, Capital Budgeting and the techniques used to evaluate Capital Budgeting proposals.

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Course Outcomes:

Student able to:

CO1: Infer the concepts of Managerial Economics and it's relationship with other disciplines.**(K_2)**

CO2: Infer the concepts of production function and cost-volume-profit analysis. **(K_2)**

CO3: Illustrate the nature of competition and pricing in different market situations and know about different market structures. **(K_2)**

CO4: Contrast different forms of business organizations and business cycles. **(K_3)**

CO5: Analyze financial statements of a company like profit and loss accounts and balance sheets. **(K_4)**

CO6: Demonstrate knowledge of capital structures and capital Budgeting**(K_2)**

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	-	-	-	-	-	1	-	-	1	2	1	-	-	-	-	2
CO2 [K2]	-	-	-	-	-	1	-	-	1	2	1	-	-	-	-	2
CO3 [K2]	-	-	-	-	-	1	-	-	1	2	1	-	-	-	-	2
CO4 [K3]	-	-	-	-	-	-	-	-	1	3	1	-	-	-	-	1
CO5 [K4]	-	-	-	-	-	-	-	-	1	3	1	-	-	-	-	1
CO6 [K2]	-	-	-	-	-	-	-	-	1	2	1	-	-	-	-	2

Program Name: II. B.Tech **Faculty Name: P. Manoj Kumar**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-I	NETWORK ANALYSIS	**R1621044**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

- To understand the basic concepts on RLC circuits.
- To know the behavior of the steady states and transients states in RLC circuits.
- To know the basic Laplace transforms techniques in periods' waveforms.
- To understand the two port network parameters.
- To understand the properties of LC networks and filters.

Course Outcomes:

Student able to:

CO1: Explain the Electrical Circuits ,A.C Fundamentals and Network Topology **(k5)**

CO2: Analyze A.C Circuits Complex impedance and phasor notation for R-L, R-C, R-L-C and Star- Delta conversion **(k6)**

CO3: Analyze Coupled Circuits and Resonance Circuits **(k6)**

CO4: Evaluate the Thevinin's, Norton's, Milliman's, Reciprocity, Compensation, Substitution, Superposition, Max Power Transfer, Tellegens- problem. **(k6)**

CO5: Explain the two port network parameters **(k6)**

CO6: Analysis and performance of Transient circuits **(k6)**

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	3	3	2	-	-	-	-	-	-	-	-	2	-	-	3	-
CO2 [K2]	3	3	3	-	-	-	-	-	-	-	-	-	-	-	3	-
CO3 [K4]	3	3	3	-	-	-	-	-	-	-	-	-	-	-	3	-
CO4 [K3]	3	3	3	-	-	-	-	-	-	-	-	-	-	-	3	-
CO5 [K4]	3	3	2	-	-	-	-	-	-	-	-	-	-	-	3	-
CO6 [K2]	3	3	3	-	-	-	-	-	-	-	-	-	-	-	3	-

Program Name: I. B.Tech **Faculty Name: Dr.J.Lakshmi Narayana**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-I	**RVSP**	R1621045	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- To give students an introduction to elementary probability theory, in preparation for courses on statistical analysis, random variables and stochastic processes.
- To mathematically model the random phenomena with the help of probability theory concepts.
- To introduce the important concepts of random variables and stochastic processes.
- To analyze the LTI systems with stationary random process as input.
- To introduce the types of noise and modelling noise sources.

Course Outcomes:

Student able to:

CO1: Identify random variables and Define and manipulate distribution and density functions.**(K3)**

CO2: Compute various operations like expectations, variances,. etc. from probability density functions and probability distribution functions**(K2)**

CO3: Characterize probability models and function of random variables based on single & multiples random variables. **(K4)**

CO4: Explain the concept of random process, differentiate between stochastic and ergodic processes. **(K2)**

CO5: Illustrate the concept of random processes and determine covariance and spectral density of stationary random processes. **(K2)**

CO6: Apply the principles of a random process in system concepts. **(K3)**

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K3]	2	1	-	-	-	-	-	-	-	3	-	-	-	-	2	-
CO2 [K2]	1	1	-	1	-	-	-	-	-	-	-	-	-	-	1	2
CO3 [K4]	2	2	1	1	-	-	-	-	-	-	-	-	-	-	3	1
CO4 [K2]	1	1	1	1	-	-	-	-	-	3	-	-	-	-	1	2
CO5 [K2]	1	1	1	1	-	-	-	-	-	2	-	-	-	-	1	2
CO6 [K3]	2	1	-	-	-	-	2	-	-	1	-	-	-	-	2	1

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Program Name: II. B.Tech **Faculty Name: D. Srikanth**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-I	SS	**R1621043**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- To introduce the terminology of signals and systems.
- To introduce Fourier tools through the analogy between vectors and signals.
- To introduce the concept of sampling and reconstruction of signals.
- To analyze the linear systems in time and frequency domains.
- To study z-transform as mathematical tool to analyze discrete-time signals and systems.

Course Outcomes:

Student able to:

CO1: Determine the mathematical representation and classify the signals based on their properties and represent signals in terms of mutual orthogonality**(K5)**

CO2: Knowledge of Frequency domain representation and analysis concepts using Fourier Transforms & Sampling**(K3)**

CO3: Analyzean LTI system and understand the concepts of Sampling theorem and apply it to reconstruct analog signals. **(K4)**

CO4: Illustrate the process of convolution and correlation between signals, its implication for analysis of linear time invariant systems**(K2)**

CO5: Determine the properties of continuous time signals and system using Laplace transforms. **(K5)**

CO6: Apply the concepts of Z-transforms, its properties and ROC to solve differential equations**(K3)**

POs' / COs'	**PO1 [k3]**	**PO2 [k4]**	**PO3 [k5]**	**PO4 [K5]**	**PO5 [K3]**	**PO6 [K3]**	**PO7 [K3]**	**PO8 [K3]**	**PO9 [K6]**	**PO10 [K2]**	**PO11 [K6]**	**PO12 [K1]**	**PSO1 [K3]**	**PSO2 [K3]**	**PSO3 [K3]**	**PSO4 [K2]**
CO1 [K5]	3	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
CO2 [K3]	2	1	1	1	-	-	-	-	-	-	-	-	-	-	2	-
CO3 [K4]	3	2	1	1	-	-	-	-	-	-	-	-	-	-	3	-
CO4 [K2]	1	1	1	1	-	-	-	-	-	-	-	-	-	-	1	-
CO5 [K5]	3	3	2	2	-	-	-	-	-	-	-	-	-	-	3	-
CO6 [K3]	2	1	1	1	-	-	-	-	-	-	-	-	-	-	2	-

Program Name: I. B.Tech **Faculty Name: M.N.L.Kalyani**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-I	**STLD**	**R1621042**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

- To study the basic philosophy underlying the various number systems, negative number representation, binary arithmetic, binary codes and error detecting and correcting binary codes.
- To study the theory of Boolean algebra and to study representation of switching functions using Boolean expressions and their minimization techniques.
- To study the combinational logic design of various logic and switching devices and their realization.

- To study the sequential logic circuits design both in synchronous and Asynchronous modes for various complex logic and switching devices, their minimization techniques and their realizations.
- To study some of the programmable logic devices and their use in realization of switching functions.

Course Outcomes:

Student able to:

CO1: Determine the philosophy of number systems and codes.**(K5)**

CO2: Simplify the logic expressions using Boolean laws and postulates and design them by using logic gates. Minimize the logic expressions using map method and tabular method. **(K4)**

CO3: Design of combinational logic circuits using conventional gates. **(K6)**

CO4: Design of combinational logic using various PLD's and synthesizing of threshold functions. **(K6)**

CO5: Analyze and design sequential systems composed of standard sequential modules, such as flip-flops and latches, counters and registers. **(K4)**

CO6: Design the FSM for completely specified and incompletely specified sequential machines. **(K6)**

POs' / **COs'**	**PO1 [k3]**	**PO2 [k4]**	**PO3 [k5]**	**PO4 [K5]**	**PO5 [K3]**	**PO6 [K3]**	**PO7 [K3]**	**PO8 [K3]**	**PO9 [K6]**	**PO10 [K2]**	**PO11 [K6]**	**PO12 [K1]**	**PSO1 [K3]**	**PSO2 [K3]**	**PSO3 [K3]**	**PSO4 [K2]**
CO1 [K5]	3	3	2	2	1	-	-	-	-	**3**	-	-	3	3	-	1
CO2 [K4]	3	2	1	1	1	-	-	-	-	-	-	-	3	3	-	1
CO3 [K6]	3	3	3	3	1	-	-	-	-	-	-	-	3	3	-	1
CO4 [K6]	3	3	3	3	1	-	-	-	-	-	-	-	3	3	-	1
CO5 [K4]	3	2	1	1	1	-	-	-	-	-	-	-	3	3	-	1
CO6 [K6]	3	3	3	3	1	-	-	-	-	-	-	-	3	3	-	1

Program Name: II. B.Tech **Faculty Name: D. Srikanth/ T. Sireesha**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-I	EDC LAB	**R1621046**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

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Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

- To indentify the basic electronic devices.
- To observe the characteristics of diodes like PN, Zener diode.
- Be familiar with rectifiers and filters.
- To observe the characteristics of transistors (BJT ,FET & UJT).
- To analyze transistor amplifiers and their frequency responses.

Course Outcomes:

Student able to:

CO1: Operate different electronic equipment and electronic components. .(K2)

CO2: Plot the volt ampere characteristics of different types of diodes and transistors. Library functions.(K2)

CO3: Verify operation of Rectifier circuits and Zener regulator circuit. .(K3)

CO4: Analyze the frequency response of BJT and FET amplifiers. .(K4)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
CO2 [K2]	1	1	1	1	-	-	-	-	-	-	-	-	1	-	-	2
CO3 [K3]	1	1	1	1	-	-	-	-	-	-	-	-	2	-	-	3
CO4 [K4]	2	2	1	1	-	-	-	-	-	-	-	-	3	-	-	3

Program Name: II. B.Tech **Faculty Name: P. Manoj Kumar /K. Narendra**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-I	N&ET LAB	R1621047	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- To determine resonance frequency, Q-factor of RLC network.
- To analysis time response of first orders RC/RL network for non-sinusoidal inputs.
- To estimate parameters of two port networks
- To understand the concept network theorems in network reduction of electrical networks.
- To determine efficiency of dc shunt machine with actual loading.
- To analyses performance of 3 phase induction motor
- To understand the significance of regulation of an alternators through synchronous impedance method.

Course Outcomes:

Student able to:

CO1: verify the theorem of the given network**(K3)**

CO2: Analyze the series and parallel resonance condition, two port network parameters.**(K4)**

CO3: verify and analyze the characteristics of dc and ac machines**(K3)**

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K3]	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
CO2 [K4]	3	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-
CO3 [K3]	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-

Program Name: II. B.Tech **Faculty Name: Y.Kumari**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-II	**ECA**	**R1622041**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- Small signal high frequency BJT transistor amplifier Hybrid-π equivalent circuit and the expressions for conductance's and capacitances are derived.
- Cascading of single stage amplifiers is discussed. Expressions for overall voltage gain are derived.
- The concept of feedback is introduced. Effect of negative feedback on amplifier characteristics is explained and necessary equations are derived.
- Bas ic principle of oscillator circuits is explained and different oscillator circuits are given with their analysis.
- Power amplifiers Class A, Class B, Class C, Class AB and other types of amplifiers are analyzed.
- Different types of tuned amplifier circuits are analyzed.

Course Outcomes:

Student able to:

CO1: Analysis of BJT and FET Amplifier circuits at high frequencies**(K4)**
CO2: Analysis of cascaded transistor and FET amplifier circuits. **(K4)**
CO3: Performance comparison of feedback amplifiers. **(K5)**
CO4: Analysis of different oscillator circuits with BJT and FET. **(K4)**
CO5: Analysis of power amplifiers. **(K4)**
CO6: Analysis of Tuned amplifiers. **(K4)**

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K4]	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3	3
CO2 [K4]	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3	3
CO3 [K5]	3	1	2	2	3	-	-	-	-	-	-	-	3	-	3	3
CO4 [K4]	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3	3
CO5 [K4]	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3	3
CO6 [K4]	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3	3

Program Name: II. B.Tech **Faculty Name: D.Srikanth**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-II	**AC**	**R1622044**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- To familiarize students with various techniques for amplitude modulation and demodulation of analog signals
- To familiarize students with techniques for generating and demodulating narrow-band and wide-band frequency and phase modulated signals
- To understand the influence of noise on the performance of Analog communication systems

Course Outcomes:

Student able to:

CO1: Demonstrate &compare various AM techniques.**(K2)**

CO2: analyze the blocks and stage of all AM systems both in time domain & frequency demine**(K4)**

CO3: Illustrate the basics of angle modulation and they can classify into phase and frequency modulation**(K2)**

CO4: Analyze the effect of noise and also performance (SNR) of different modulation schemes in the presence of noise. **(K4)**

CO5: Illustrate basicknowledgeofvarious Modulated Signals through Transmitters & Receivers. **(K2)**

CO6: Analyze various pulse modulation techniques and TDM**(K4)**

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	**1**	1	**1**	-	-	-	-	-	-	**2**	**1**	**1**	-	-	1	-
CO2 [K4]	**3**	2	**1**	-	-	-	-	-	-	**3**	**1**	**1**	-	-	3	-
CO3 [K2]	**1**	1	**1**	-	-	-	-	-	-	**2**	**1**	**1**	-	-	1	-
CO4 [K4]	**3**	2	**1**	**1**	**3**	**3**	-	-	-	-	**1**	**1**	-	-	3	-
CO5 [K2]	**1**	1	**1**	**1**	**1**	**1**	-	-	-	-	**1**	**1**	-	-	1	-
CO6 [K4]	**3**	2	**1**	**1**	**3**	-	-	-	-	-	**1**	**1**	-	-	3	-

Program Name: II. B.Tech **Faculty Name: P.Manoj Kumar**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-II	**CONTROL SYSTEMS**	**R1622042**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- To introduce the concepts of open loop and closed loop systems, mathematical models of mechanical and electrical systems, and concepts of feedback
- To study the characteristics of the given system in terms of the transfer function and introducing various approaches to reduce the overall system for necessary analysis
- To develop the acquaintance in analyzing the system response in time-domain and frequency domain in terms of various performance indices
- To analyze the system in terms of absolute stability and relative stability by different approaches
- To design different control systems for different applications as per given specifications

- To introduce the concepts of state variable analysis, design and also the concepts of controllability and observability

Course Outcomes:

Student able to:

CO1: Measure electrical & mechanical systems by mathematical modeling.(K5)

CO2: Evaluate overall transfer function using block diagram algebra and signal flow graph. (K5)

CO3: Evaluate Transient, Steady State behavior and time response of second order systems. (K5)

CO4: Explain the skills of absolute and relative stability of LTI systems. (K5)

CO5: Create Capability to analyze the stability of LTI systems using frequency response methods. (K6)

CO6: Design of compensators and analyses physical systems as state models. (K6)

POs' / COs'	**PO1 [k3]**	**PO2 [k4]**	**PO3 [k5]**	**PO4 [K5]**	**PO5 [K3]**	**PO6 [K3]**	**PO7 [K3]**	**PO8 [K3]**	**PO9 [K6]**	**PO10 [K2]**	**PO11 [K6]**	**PO12 [K1]**	**PSO1 [K3]**	**PSO2 [K3]**	**PSO3 [K3]**	**PSO4 [K2]**
CO1 [K5]	3	3	2	2	3	3	3	-	-	-	-	3	-	-	3	-
CO2 [K5]	3	3	2	2	-	-	-	-	-	-	-	-	-	-	3	-
CO3 [K5]	3	3	2	2	3	-	-	-	-	-	-	-	-	-	3	-
CO4 [K5]	3	3	2	2	3	-	-	-	-	-	-	-	-	-	3	-
CO5 [K6]	3	3	3	3	3	-	-	-	-	-	-	-	-	-	3	-
CO6 [K6]	3	3	3	3	3	3	-	-	-	-	-	3	-	-	3	-

Program Name: Ii. B.Tech **Faculty Name: B.Praveen kitti/R.V.Shashank**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-II	**EMTL**	**R1622043**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The main objectives of this course are to understand:

- Fundamentals of steady electric and magnetic fields using various laws
- The concept of static and time varying Maxwell equations and power flow using pointing theorem
- Wave characteristics in different media for normal and oblique incidence
- Various concepts of transmission lines and impedance measurements

Course Outcomes:

Student able to:

CO1: Analyze the basic concepts of electric and magnetic fields using different laws**(K4)**

CO2: Assess the relationship between electric and magnetic fields and derive Maxwell's Equation. **(K5)**

CO3: Formulate the wave equations in perfect dielectric and conduction media**(K6)**

CO4: Compile and derive the equations of reflection and refraction of Electromagnetic waves in different media(K6)

CO5: Analyze transmission lines and their parameters(K4)

CO6: Elaborate various parameters for transmission lines using either a Smith chart or classical theory. (K6)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K4]	3	2	1	-	-	-	-	-	-	-	-	1	-	-	-	-
CO2 [K5]	3	3	2	-	-	-	-	-	-	-	-	1	-	-	-	-
CO3 [K6]	3	3	3	-	-	-	-	-	-	-	-	1	-	-	3	-
CO4 [K6]	3	3	3	-	-	-	-	-	-	-	-	1	-	-	1	-
CO5 [K4]	3	2	1	1	1	-	1	-	-	-	-	1	-	-	1	-
CO6 [K6]	3	3	3	3	1	-	1	-	-	-	-	1	-	-	2	-

Program Name: I. B.Tech **Faculty Name: N.RAMA KRISHNA**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-II	**MS**	**R1622026**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
72 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- To familiarize with the process of management and to provide basic insight into select contemporary management practices
- To provide conceptual knowledge on functional management and strategic management.

Course Outcomes:

Student able to:

CO1: Infer the Nature of Management theories and motivation styles**(K2)**

CO2: Analyze the principle of project Management and project Crashing. **(K4)**

CO3: Illustrate the principles of Functional Management. **(K2)**

CO4: Analyze strategic Management principles and understand them. **(K4)**

CO5: Analyze the fundamentals of Business Ethics and Communication. **(K4)**

CO6: Demonstrate knowledge of Principles of Contemporary Management Practices.**(K2)**

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	-	-	-	-	-	1	-	-	1	2	1	-	-	-	-	2
CO2 [K4]	-	-	-	-	-	3	-	-	1	3	1	-	-	-	-	3
CO3 [K2]	-	-	-	-	-	1	-	-	1	2	1	-	-	-	-	2
CO4 [K4]	-	-	-	-	-	-	-	-	1	3	1	-	-	-	-	3
CO5 [K4]	-	-	-	-	-	-	-	-	1	3	1	-	-	-	-	3
CO6 [K2]	-	-	-	-	-	-	-	1	1	2	1	-	-	-	-	2

Program Name: II. B.Tech **Faculty Name: K.Sundar Srinivas**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-II	**PDC**	**R1622044**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- To understand the concept of wave shaping circuits, Switching Characteristics of diode and transistor.
- To study the design and analysis of various Multivibrators.
- To understand the functioning of different types of time-base Generators.
- To learn the working of logic families & Sampling Gates.

Course Outcomes:

Student able to:

CO1: Analyze linear wave shaping circuits. (K4)
CO2: Developnon linear wave shaping circuits usi ng diodes and transistors. (K3)
CO3: Design transistor switch and logic gates. (K6)
CO4: Design different multi vibrators using transistors. (K6)
CO5: Explain various time base generators using transistors. (K2)
CO6: Discuss various synchronization techniques and sampling gates(K6)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K4]	3	2	1	1	3	-	-	-	-	-	-	-	3	3	3	-
CO2 [K3]	2	1	1	1	2	-	-	-	-	-	-	-	-	2	-	-
CO3 [K6]	3	3	3	3	-	-	-	-	-	-	-	1	3	3	3	-
CO4 [K6]	3	3	3	3	-	-	-	-	-	-	-	-	-	3	-	-
CO5 [K2]	1	1	1	1	-	-	-	-	-	-	-	-	1	1	1	-
CO6 [K6]	3	3	3	-	-	-	-	-	-	-	-	-	-	1	-	-

Program Name: II. B.Tech **Faculty Name: D.Srikanth/G.V.Ramanaiah**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-II	**AC LAB**	**R1622047**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The main objective of analog communication laboratory is to study various analog modulation schemes using hardware, and software through SCILAB

Course Outcomes:

Student able to:

CO1: Verify various modulation and demodulation techniques through hardware and software.**(K2)**

CO2: Design and verify operation of Pre-emphasis and De-Emphasis circuits and to plot the frequency response. **(K6)**

CO3: Illustrate the operations of different types of detectors. **(K2)**

CO4: Verification of Spectral analysis of AM and FM on spectrum analyzer. **(K2)**

CO5: Verification of pulse modulation techniques like PAM, PWM and PPM. **(K2)**

CO6: Verify sampling theorem and its effects. **(K2)**

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	1	-	1	1	1	1	1	1	1	2	1	3	-	-	-	2
CO2 [K6]	3	-	3	3	3	3	3	3	2	3	2	3	-	-	-	3
CO3 [K2]	1	-	1	1	1	1	-	-	1	2	1	3	-	-	-	2
CO4 [K2]	1	-	1	-	-	-	-	-	1	2	1	3	-	-	-	2
CO5 [K2]	1	-	1	1	1	1	1	1	1	2	1	3	-	-	-	2
CO6 [K2]	1	-	1	1	1	1	1	1	1	2	1	3	-	-	-	2

Program Name: II. B.Tech **Faculty Name: Y.Kumari/D.Suresh Babu**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	II-II	**ECA LAB**	**R1622046**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

- To prepare the students how to use modern simulation tools such as ESIM, MULTISIM etc. for design ,analysis and performance evaluation of electronic circuits.
- Design, simulate and construct various electronic circuits through software and hardware.
- To develop problem solving skills in electronic circuits and to design electronic circuits to meet desired specifications

Course Outcomes:

Student able to:

CO1: Design different types of Amplifier and Oscillator circuits**(K6)**

CO2: Simulate different types of Amplifier and Oscillator circuits using software tool. **(K6)**

CO3: Test different types of Amplifiers and Oscillator circuits using hardware. **(K4)**

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K6]	3	3	3	3	-	-	-	-	-	-	-	-	3	-	3	-
CO2 [K6]	3	-	3	3	3	-	-	-	-	-	-	-	3	-	3	-
CO3 [K4]	3	-	1	1	-	-	-	-	-	-	-	-	3	-	3	-

Program Name: III. B.Tech **Faculty Name: G.V.Ramanaiah**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	III-I	LICA	R1631042	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To understand the basic operation &performance parameters of differential amplifiers.
2. To understand & learn the measuring techniques of performance parameters of OP-AMP
3. To learn the linear and non-linear applications of operational amplifiers.
4. To understand the analysis & design of different types of active filters using opamps
5. To learn the internal structure, operation and applications of different analog ICs
6. To Acquire skills required for designing and testing integrated circuits

Course Outcomes:

Student able to:

CO1: Analyze the characteristics of op-amps.(K4)
CO2: Evaluate DC and AC characteristics of op-amp. (K5)
CO3: Inspect the Linear and Non Linear Applications of Op-Amp. (K4)
CO4: Design different types of Active filters. (K6)
CO5: Apply the Timer circuits and Phase Locked Loop for variousapplications. (K3)
CO6: Inspect different types of ADC and DAC Circuits. (K4)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K4]	3	2	1	-	-	-	-	-	-	-	-	3	3	-	-	-
CO2 [K5]	3	3	2	2	-	-	-	-	-	-	-	3	3	-	-	-
CO3 [K4]	3	2	1	1	3	3	-	-	1	-	-	3	3	-	-	-
CO4 [K6]	3	3	3	3	3	-	-	-	-	-	-	3	3	-	3	-
CO5 [K3]	2	1	1	1	2	2	-	-	1	-	-	3	2	-	-	-
CO6 [K4]	3	2	1	1	3	3	-	-	1	3	1	3	3	3	3	-

Program Name: III. B.Tech **Faculty Name: B.Mohan Swaroop**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	III-I	**DSD DICA**	R1631043	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The main objectives of this course are:

1. Introduction of digital logic families and interfacing concepts for digital design is considered.
2. VHDL fundamentals were discussed to modeling the digital system design blocks.
3. VHDL compilers, simulators and synthesis tools are described, which are used to verify digital systems in a technology-independent fashion.
4. Design and implementation of combinational and sequential digital logic circuits is explained.

Course Outcomes:

Student able to:

CO1: Application:Develop:-- Illustrate the elements of VHDL and develop the VHDL programs for internal circuits for Integrated circuits .(K3)

CO2: Comprehension: Explain:--Explain the concepts of pre layout simulation and post layout simulation ,synthesis . (K2)

CO3: Synthesise: Design:--Study different IC s for PLDs and Memories like ROM &RAM and design PLDs for various Boolean functions . (K6)

CO4: Synthesise: Design:--Demonstrate the concepts of CMOS behavior and different logic families and design various logic circuits using CMOS. (K6)

CO5: Application: Model:--outline design considerations for Integrated circuits of all combinational circuits like adder, subtractor, multipliers, multiplexers, encoders, decoders and model them using VHDL. (K3)

CO6: Application: Model:--outline design considerations for Integrated circuits of all sequential circuits like registers, counters, flip flops, model them using VHDL. (K3)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K3]	-	1	1	-	2	-	-	-	-	-	1	-	-	-	-	-
CO2 [K2]	-	1	-	-	-	-	-	-	-	-	1	-	1	-	-	-
CO3 [K6]	-	3	3	-	3	-	-	-	2	-	2	-	3	-	-	-
CO4 [K6]	-	3	3	-	3	-	-	-	-	-	2	-	3	-	-	-
CO5 [K3]	-	1	1	-	2	-	-	-	-	-	1	-	2	-	-	-
CO6 [K3]	-	1	1	-	2	-	-	-	-	-	1	-	2	-	-	-

Program Name: III. B.Tech **Faculty Name: Dr.M.Rangarao**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	III-I	**DC**	R1631044	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. Understand different pulse digital modulation techniques and their comparison
2 .Familiarize various digital modulation techniques and calculation of their error probabilities
3. Understand the concept of entropy and different source coding techniques
4. Familirize with block codes, cyclic codes and convolution codes

Course Outcomes:

Student able to:

CO1: Distinguish Different digital modulation systems. (K4)

CO2: Discuss different digital modulation techniques.(K6)

CO3: Analyze the performance of a Digital Communication System for probability of error and are able to design a digital communication system.(K4)

CO4: Estimate the amount of Information and entropy.(K5)

CO5: Compare various source coding techniques. (K5)

CO6: Analyze Block codes, cyclic codes and convolution codes. (K4)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K4]	3	-	1	-	-	3	-	-	-	3	-	3	-	-	3	-
CO2 [K6]	3	-	3	-	-	3	-	-	-	3	-	3	-	-	3	-
CO3 [K4]	3	2	1	-	-	3	-	-	-	3	-	3	-	-	3	-
CO4 [K5]	3	3	2	2	-	3	-	-	-	3	-	3	-	-	3	-
CO5 [K5]	3	3	2	2	-	3	-	-	-	-	-	3	-	-	3	-
CO6 [K4]	3	2	1	1	-	-	-	-	-	3	-	3	-	-	3	-

Program Name: IV. B.Tech **Faculty Name: A.Ramesh**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	IV-I	CAO	R1631041	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The student will

- Understand the fundamentals of different instruction set architectures and their relationship to the CPU design.
- Understand the principles and the implementation of computer arithmetic and ALU.
- Understand the memory system, I/O organization
- Understand the operation of modern CPUs including interfacing, pipelining, memory systems and busses.
- Understand the principles of operation of multiprocessor systems.

Course Outcomes:

Student able to:

CO1: Solve arithmetic operations: addition, subtraction, multiplication and division of Binary, BCD using algorithms.(K3)

CO2: Illustrate Addressing modes and Instruction codes of a processor.(K2)

CO3: Design a memory module and analyze its operation by interfacing with the CPU.(K6)

CO4: Discuss the set of specific instructions, design CPU with micro programmed control.(K6)

CO5: Design an I/O module and analyze its operation.(K6)

CO6: Apply design techniques using Pipeline and Vector Processing for a Given CPU Organization,. (K3)

POs' / COs'	**PO1 [k3]**	**PO2 [k4]**	**PO3 [k5]**	**PO4 [K5]**	**PO5 [K3]**	**PO6 [K3]**	**PO7 [K3]**	**PO8 [K3]**	**PO9 [K6]**	**PO10 [K2]**	**PO11 [K6]**	**PO12 [K1]**	**PSO1 [K3]**	**PSO2 [K3]**	**PSO3 [K3]**	**PSO4 [K2]**
CO1 [K3]	2	1	-	-	-	-	-	-	-	-	-	3	2	2	2	-
CO2 [K2]	-	1	-	-	-	-	-	-	-	-	-	-	1	1	1	-
CO3 [K6]	-	3	-	-	-	-	-	-	-	-	-	-	3	3	3	-
CO4 [K6]	-	3	-	-	-	-	-	-	-	-	-	-	3	3	3	-
CO5 [K6]	3	-	-	-	-	-	-	-	-	-	-	3	3	3	3	-
CO6 [K3]	2	-	-	-	-	-	-	-	-	-	-	3	2	2	2	-

Program Name: III. B.Tech **Faculty Name: R.V.Shashanka**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	III-I	ANTENNAS AND WAVE PROPAGATION	R1631045	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The student will be able to

- Understand the applications of the electromagnetic waves in free space.
- introduce the working principles of various types of antennas
- Discuss the major applications of antennas with an emphasis on how antennas are employed to meet electronic system requirements.
- Understand the concepts of radio wave propagation in the atmosphere

Course Outcomes:

Student able to:

CO1: Identify the importance of various antenna parameters(K3)
CO2: Assess the characteristics of wire and Loop antennas(K5)
CO3: Design array antenna systems from specifications. (K6)
CO4: Measure the fields radiated by various types of antennas like Long wire, Microstrip, Helical etc., (K5)
CO5: Discuss VHF, UHF, Microwave antennas and their Design. (K6)
CO6: Elaborate various modes of radio wave propagation. (K6)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K3]	2	1	-	-	-	-	-	-	-	3	-	-	-	-	2	-
CO2 [K5]	3	3	2	2	3	-	-	-	-	-	-	-	-	-	3	-
CO3 [K6]	3	3	3	3	3	-	-	-	-	-	-	-	-	-	3	-
CO4 [K5]	3	3	2	2	3	-	-	-	-	-	-	-	-	-	3	-
CO5 [K6]	3	3	3	3	3	-	-	-	-	3	-	-	-	-	3	-
CO6 [K6]	3	3	-	-	3	-	3	-	-	3	-	-	-	-	3	-

Program Name: III. B.Tech **Faculty Name: M.Rama krishna**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	I	**PROFESSIONAL ETHICS and HUMAN VALUES**		18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
25 Hrs	2	-	-	-	-	-

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

1. To give basic insights and inputs to the student to inculcate Human values to grow as a responsible human beings with proper personality.
2. Professional Ethics instills the student to maintain ethical conduct and discharge their professional duties.

Course Outcomes:

Student able to:

CO1: Analyzing the human values. (K4)
CO2: Attribute the ethical values to develop professional qualities. (K4)
CO3: Evaluate experimentation on social scale. (K5)
CO4: Create plausible project including safety factors. (K6)
CO5: Attribute responsibilities and rights of engineer’s. (K4)
CO6: Differentiating issues on global scale. (K4)

POs’ / COs’	**PO1 [k3]**	**PO2 [k4]**	**PO3 [k5]**	**PO4 [K5]**	**PO5 [K3]**	**PO6 [K3]**	**PO7 [K3]**	**PO8 [K3]**	**PO9 [K6]**	**PO10 [K2]**	**PO11 [K6]**	**PO12 [K1]**	**PSO1 [K3]**	**PSO2 [K3]**	**PSO3 [K3]**	**PSO4 [K2]**
CO1 [K4]	3	2	-	-	-	3	-	-	-	-	-	-	-	-	-	-
CO2 [K4]	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3 [K5]	-	3	-	-	-	-	-	3	-	-	-	-	-	-	-	-
CO4 [K6]	-	3	-	-	-	3	-	-	-	-	-	-	-	-	-	-
CO5 [K4]	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-
CO6 [K4]	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-

Program Name: III. B.Tech **Faculty Name: Dr.M Rangarao/B.Mohan Swaroop**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	III-I	**DSD DICA LAB**	R1631048	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

- Understand the work flow of Xilinx tools for digital design.
- Simulate combinational logic circuits.
- Simulate Sequential logic circuits.
- Synthesize combinational logic circuits.
- Synthesize Sequential logic circuits.
- Implementation of memory elements and ALU.

Course Outcomes:

Student able to:

CO1: Synthesize: Design:-Design and draw the internal structure of the following Digital Integrated Circuits.(K6)

CO2: Analyze :Analyze :- Perform simulation using relevant simulator and analyze the obtained simulation results using necessary synthesizer. (K4)

CO3: Application: Develop:-Develop VHDL source code for Combinational ICs. (K3)

CO4: Application: Develop:-Develop VHDL source code for Sequential ICs. (K3)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K6]	3	3	3	3	3	3	-	-	2	-	2	3	3	3	-	-
CO2 [K4]	3	2	1	1	3	3	-	-	1	-	1	1	3	3	-	-
CO3 [K3]	2	1	1	1	2	2	-	-	1	-	1	3	2	2	-	-
CO4 [K3]	2	1	1	1	2	2	-	-	1	-	1	3	2	2	-	-

Program Name: III. B.Tech **Faculty Name: G.V.Ramanaiah/S.Pradeep kumar**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	III-I	**LICA LAB**	R1631047	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

- Analyze and design various applications of Op-Amp IC 751
- Analyze and design various applications of Timer IC 555
- Understand various voltage regulators
- Understand various applications of IC 565
- Understand digital to analog conversion

Course Outcomes:

Student able to:

CO1: Design Adder, Subtractor, Comparator, integrator & differentiator using OP AmpIC741.(K6)

CO2: Design different types of active filters. (K6)

CO3: Design different oscillator circuits and Function generator using OP-Amp IC741. (K6)

CO4: Design different Multivibrators using IC555 timer. (K6)

CO5: Use IC565 for PLL, IC566 for VCO, IC723for voltage regulator &IC7805,7809,7912 for three terminal voltage regulators. (K3)

CO6: Design 4-bit DAC using OP-Amp. (K6)

POs' / **COs'**	**PO1 [k3]**	**PO2 [k4]**	**PO3 [k5]**	**PO4 [K5]**	**PO5 [K3]**	**PO6 [K3]**	**PO7 [K3]**	**PO8 [K3]**	**PO9 [K6]**	**PO10 [K2]**	**PO11 [K6]**	**PO12 [K1]**	**PSO1 [K3]**	**PSO2 [K3]**	**PSO3 [K3]**	**PSO4 [K2]**
CO1 [K6]	3	3	3	3	3	3	-	-	2	3	-	-	1	1	1	1
CO2 [K6]	3	3	3	3	3	3	-	-	2	3	-	-	1	1	1	1
CO3 [K6]	3	3	3	3	3	3	-	-	2	3	-	-	1	1	1	1
CO4 [K6]	3	3	3	3	3	3	-	-	2	3	-	-	1	1	1	1
CO5 [K3]	2	1	1	1	2	2	-	-	1	3	-	-	2	2	2	3
CO6 [K6]	3	3	3	3	3	3	-	-	2	3	-	-	1	1	1	1

Program Name: III. B.Tech **Faculty Name: K.Sundar srinivas/N.Mounika**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	III-I	PDC LAB	R1631046	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

- This laboratory aims to produce graduates to design a pulse circuits and to verify functionality of digital circuits along with their applications.
- This course makes the student solve engineering programming problems which lays foundation to analyze pulse circuits.
- The student will acquire knowledge to design multivibrators (using Transistors), filters, switch (using Transistor), Time base generators, Clippers and Clampers.
- The students will be able to realize logic gates using discrete components, and applications of Combinational and sequential Circuits.

Course Outcomes:

Student able to:

CO1: Design various Linear and Non Linear wave shaping networks.(K6)

CO2: Construct transistor as a switch. (K3)

CO3: Examine the working of various logic gates and sampling gates by using discrete Components. (K4)

CO4: Justifythe truth tables of different flip-flops. (K5)

CO5: Develop different Multivibrators. (K3)

CO6: Create sweep waveforms using UJT and bootstrap sweep circuit. (K6)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K6]	3	3	3	3	-	-	-	-	-	-	-	-	-	3	3	-
CO2 [K3]	2	1	1	1	-	-	-	-	-	-	-	-	-	2	-	-
CO3 [K4]	3	2	1	1	-	-	-	-	-	-	-	-	3	3	3	-
CO4 [K5]	3	3	2	2	-	-	-	-	-	-	-	-	3	3	3	-
CO5 [K3]	2	1	1	1	-	-	-	-	-	-	-	-	-	2	2	-
CO6 [K6]	3	3	3	3	-	-	-	-	-	-	-	-	-	2	-	-

Program Name: III. B.Tech **Faculty Name: Dr.M.Rangarao**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	III-II	**DSP**	**RT32042**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- The student will be able to
- Analyze the Discrete Time Signals and Systems
- Know the importance of FFT algorithm for computation of Discrete Fourier Transform
- Understand the various implementations of digital filter structures
- Learn the FIR and IIR Filter design procedures
- Know the need of Multi rate Processing
- Learn the concepts of DSP Processors

Course Outcomes:

Student able to:

CO1: Apply the difference equations concept in the analyzation of Discrete time systems.(K3)

CO2: Use the FFT algorithm for solving the DFT of a given signal.(K3)

CO3: Design a Digital filter (FIR&IIR) from the given specifications.(K6)

CO4: Build the FIR and IIR structures from the designed digital filter.(K6)

CO5: Use the Multirate Processing concepts in various applications(eg: Design of phase shifters, Interfacing of digital systems…).(K3)

CO6: Apply the signal processing concepts on DSP Processor.(K3)

POs' / **COs'**	**PO1 [k3]**	**PO2 [k4]**	**PO3 [k5]**	**PO4 [K5]**	**PO5 [K3]**	**PO6 [K3]**	**PO7 [K3]**	**PO8 [K3]**	**PO9 [K6]**	**PO10 [K2]**	**PO11 [K6]**	**PO12 [K1]**	**PSO1 [K3]**	**PSO2 [K3]**	**PSO3 [K3]**	**PSO4 [K2]**
CO1 [K3]	2	1	1	-	-	-	-	-	-	-	1	-	-	-	2	-
CO2 [K3]	2	1	-	1	-	-	-	-	-	-	-	-	-	-	2	-
CO3 [K6]	3	3	3	-	-	3	-	-	-	-	2	-	-	-	3	-
CO4 [K6]	3	3	3	3	-	3	-	-	-	-	2	-	-	-	3	-
CO5 [K3]	2	1	1	-	-	2	-	-	-	-	1	-	-	-	2	-
CO6 [K3]	2	-	-	-	-	2	2	-	1	-	1	1	-	-	2	-

Program Name: III. B.Tech **Faculty Name: M.Rama krishna**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	III-II	**IPR&P**	**RT31016**	19-11-2018

.Total No. of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
25 Hrs	4	-	2 Hrs	-	-	-

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

- Learn the concept of Intellectual Proprieties, its importance for engineers and recognize the need to obtain Intellectual right and various agencies supporting
- Learn Patent Law, Requirements to be patentable, Double Patenting and Patent Searching
- Learn what Trade Secret is and make use of Employee Confidentiality Agreement.

Course Outcomes:

Student able to:

CO1: Explain the concept of Intellectual Proprieties, its importance for engineers and recognize the need to obtain Intellectual right and various agencies supporting IP.(K2)

CO2: Explain copyright law in terms of Rights, Ownership, Transfer and Duration, Infringement and International Copyright Law and outline about Semiconductor Chip Protection Act. (K2)

CO3: Explain Patent Law, Requirements to be patentable, Double Patenting and Patent Searching. How International patent law works: PCT and Invention Developers and promoters. (K2)

CO4: Explain Trade Marks, its maintenance, Transfer of rights, Inter parties Proceedings, Infringement. Classify Likelihood of confusion in Trade Mark and outline International Trade Mark Law. (K2)

CO5: Explain what Trade Secret is and make use of Employee Confidentiality Agreement. Illustrate Trade Secret Law, Unfair Competition and Breach of Contract. (K2)

CO6: Explain what Cyber Law is: Cyber Crime and E-commerce, Data Security. Analyze how Information Technology Act works. (K2)

POs' / COs'	**PO1 [k3]**	**PO2 [k4]**	**PO3 [k5]**	**PO4 [K5]**	**PO5 [K3]**	**PO6 [K3]**	**PO7 [K3]**	**PO8 [K3]**	**PO9 [K6]**	**PO10 [K2]**	**PO11 [K6]**	**PO12 [K1]**	**PSO1 [K3]**	**PSO2 [K3]**	**PSO3 [K3]**	**PSO4 [K2]**
CO1 [K2]	-	1	1	-	-	1	1	1	1	2	1	3	-	-	-	2
CO2 [K2]	-	1	1	-	-	1	1	1	1	2	1	3	-	-	-	2
CO3 [K2]	-	1	1	-	-	1	1	1	1	2	1	3	-	-	-	2
CO4 [K2]	-	1	1	-	-	1	1	1	1	2	1	3	-	-	-	2
CO5 [K2]	-	1	1	-	-	1	1	1	1	2	1	3	-	-	-	2
CO6 [K2]	-	1	1	-	-	1	1	1	1	2	1	3	-	-	-	2

Program Name: III. B.Tech **Faculty Name: Pradeep Kumar**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	III-II	**MPMC**	**RT32041**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
75 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

- Learn concepts of microprocessor, different addressing modes and programming of 8086.
- Understand interfacing of 8086, with memory and other peripherals.
- Learn concept of DMA, USART RS-232 and PIC controller.
- Study the features of advanced processors and Pentium processors.
- Study the features of 8051 Microcontroller, its instruction set and also other controllers.

Course Outcomes:

Student able to:

CO1: Explain the architecture, register set, memory organization, Minimum mode and Maximum mode operation, different addressing modes and instruction set of 8086.(K2)

CO2: Develop 8086 Assembly level programs for different addressing modes and for interrupts. (K3)

CO3: Develop programs for 8086 interfacing with different peripherals. (K3)

CO4: Explain the concepts of advanced processor 80386 and coprocessor 80387. (K2)

CO5: Develop assembly level programs for 8051 Microcontroller. (K3)

CO6: Explain the features, architecture, instruction set of PIC and ARM Microcontrollers.(K2)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2 [K3]	2	1	1	-	-	2	-	-	-	-	1	3	-	-	-	-
CO3 [K3]	2	-	1	1	2	2	-	-	1	3	1	3	2	2	2	3
CO4 [K2]	1	-	1	-	1	-	-	-	-	-	-	-	1	1	1	1
CO5 [K3]	2	1	1	-	2	2	-	-	1	-	1	3	2	2	2	3
CO6 [K2]	1	-	1	1	1	1	-	-	1	2	1	3	1	1	1	1

Program Name: III. B.Tech **Faculty Name: Dr.J.Lakshmi Narayana**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	III-II	**MWE**	**RT32044**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The student will

- Understand fundamental characteristics of waveguides and Micro strip lines through electromagnetic field analysis.
- Understand the basic properties of waveguide components and Ferrite materials composition
- Understand the function, design, and integration of the major microwave components oscillators, power amplifier.
- Understand a Microwave test bench setup for measurements.

Course Outcomes:

Student able to:

CO1: Recall knowledge of transmission lines and waveguide structures and they usage as elements in impedance matching and filter circuits.(K1)

CO2: Inspect the various parameters and characteristics of the various Micro strips, cavity resonators. (K4)

CO3: Apply analysis methods to determine circuit properties of passive or active microwave devices. (K3)

CO4: Analyze the difference between the conventional tubes and the microwave tubes for the transmission of the EM waves. (K4)

CO5: Illustrate the significance, types and characteristics of the slow wave structures used for the transmission of the microwave frequencies. (K2)

CO6: Analyze and measure various microwave parameters using a Microwave test bench. (K4)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K1]	1	1	-	-	-	-	-	-	-	-	-	1	-	-	1	-
CO2 [K4]	3	2	-	-	-	-	-	-	-	-	-	-	-	-	3	-
CO3 [K3]	2	-	-	-	-	-	-	-	-	-	1	-	-	2	-	-
CO4 [K4]	3	-	-	-	-	-	-	-	-	-	1	-	-	3	-	-
CO5 [K2]	1	-	-	-	-	-	-	-	-	-	-	3	-	-	1	-
CO6 [K4]	3	2	-	1	-	-	-	-	-	1	-	3	3	-	3	-

Program Name: III. B.Tech **Faculty Name: A.Ramesh**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	III-II	**VLSI**	**RT41041**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
72 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The student will be introduced to

- Use mathematical methods and circuit analysis models in analysis of CMOS digital electronics circuits, including logic components and their interconnects.
- Learn the various fabrication steps of IC and come across basic electrical properties of MOSFET.
- Apply CMOS technology-specific layout rules in the placement and routing of transistors and interconnect and to verify the functionality, timing, power and parasitic effects.
- The concepts and techniques of modern integrated circuit design and testing (CMOS VLSI).
- Design static CMOS combinational and sequential logic at the transistor level, including mask layout.

Course Outcomes:

Student able to:

CO1: Demonstrate the fundamentals of IC technology such as various MOS fabrication technologies and IC production steps and electrical properties of MOS circuits.(K2)

CO2: Apply the Concept of nMOS and CMOS design rules to the layout of a circuit . (K3)

CO3: Explain basic circuit concepts and how it impacts scaling and performance. (K2)

CO4: Illustrate the considerations of subsystem design processes and Architectural issues. (K2)

CO5: Explain the concepts of VLSI design issues and current trends in semiconductor technology. (K2)

CO6: Explain FPGA architecture,configuration,configuration modes and step-by-step approach of FPGA design process. (K2)

POs' / COs'	**PO1 [k3]**	**PO2 [k4]**	**PO3 [k5]**	**PO4 [K5]**	**PO5 [K3]**	**PO6 [K3]**	**PO7 [K3]**	**PO8 [K3]**	**PO9 [K6]**	**PO10 [K2]**	**PO11 [K6]**	**PO12 [K1]**	**PSO1 [K3]**	**PSO2 [K3]**	**PSO3 [K3]**	**PSO4 [K2]**
CO1 [K2]	1	1	-	-	-	-	-	-	-	-	-	3	1	1	-	-
CO2 [K3]	-	1	-	-	-	-	-	-	-	-	-	3	2	2	-	-
CO3 [K2]	-	1	1	-	-	-	-	-	-	-	-	3	1	1	-	-
CO4 [K2]	-	1	-	-	-	-	-	-	-	-	-	3	1	1	-	-
CO5 [K2]	1	-	1	-	-	-	-	-	-	-	-	3	1	1	-	-
CO6 [K2]	1	-	-	-	-	-	-	-	-	-	-	3	1	1	-	-

Program Name: III. B.Tech **Faculty Name: N.Mounika/Ch.Amala**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	III-II	**DC LAB**	**RT32047**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

- Study the multiplexing and de-multiplexing techniques.
- Understand pulse digital modulation systems such as PCM, DPCM and DM.
- Understand various digital modulation techniques.
- Study the need for source coding.
- Study Block codes, cyclic codes and convolution codes.

Course Outcomes:

Student able to:

CO1: Illustrate the time-division multiplexing (TDM) systems.(K6)
CO2: Evaluate base band modulation schemes. .(K5)
CO3: Demonstrate different band pass modulation schemes. .(K2)
CO4: Inspect the companding technique. .(K4)
CO5: Estimate source coding techniques. .(K5)
CO6: ExamineBinary Cyclic and Convolution Codes . .(K4)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K6]	3	3	3	-	-	3	-	-	-	3	-	3	-	-	3	-
CO2 [K5]	3	3	2	-	-	3	-	-	-	3	-	3	-	-	3	-
CO3 [K2]	1	1	1	-	-	1	-	-	-	2	-	3	-	-	1	-
CO4 [K4]	3	2	1	1	-	3	-	-	-	3	-	3	-	-	3	-
CO5 [K5]	3	3	2	-	-	3	-	-	-	3	-	3	-	-	3	-
CO6 [K4]	3	2	1	1	-	3	-	-	-	3	-	3	-	-	3	-

Program Name: III. B.Tech **Faculty Name: Pradeep kumar/D.Gowthami**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	III-II	**MPMC LAB**	**RT32046**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The main objectives of the course is to impart

- To learn the programming concepts of 8086 microprocessor in Assembly Level Language using Assembler directives and also able to learn hardware and software interaction and integration.
- To understand the interfacing concepts of peripheral devices like A/D and D/A with 8255, 8279 Keyboard/Display Controller, generation of waveforms using Intel 8253/8254 with 8086 microprocessor.
- To learn the programming concepts of 8051 Microcontroller in Assembly Level Language using 8051.

- To understand the interfacing concepts of switches and LEDs, 7 segment display, Stepper motor interface, Traffic light controller with 8051 microcontroller.

Course Outcomes:

Student able to:

CO1: Apply the 8086 Microprocessor and 8051 Microcontroller instruction set for executing the different assembly level language programs using MASM/TASM Assembler.(K3)

CO2: Apply the Interfacing concepts of various I/O and peripheral devices like stepper motor, key board, ADC and DAC with 8086 assembly level language programs. (K3)

CO3: DevelopC programs for interfacing modules with 8051 using Keil U Vision software. (K3)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K3]	-	-	1	-	2	-	-	-	1	-	1	-	-	-	-	3
CO2 [K3]	-	-	1	-	2	-	-	-	1	-	1	-	1	-	1	3
CO3 [K3]	-	-	1	-	2	-	-	-	1	-	1	-	-	-	1	-

Program Name: III. B.Tech **Faculty Name: Smt. G.M.G. Madhuri/A.Ramesh**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	III-II	**VLSI LAB**	**RT4104L**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hrs	-	3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

- Use mathematical methods and circuit analysis models in analysis of CMOS digital electronics circuits, including logic components and their interconnects.
- Apply CMOS technology-specific layout rules in the placement and routing of transistors and interconnect and to verify the functionality, timing, power and parasitic effects.
- Design static CMOS combinational and sequential logic at the transistor level, including mask layout.

Course Outcomes:

CO1: Design Inverter, Universal gates ,Full adder and Full subtractorusing130nm CMOS technology with EDA Tools.(K6)

CO2: Design RS – latch, D-latch and Asynchronous counterUsing130nm CMOS Technology with EDA Tools. (K6)

CO3: Design Static RAM Using130nm CMOS Technology with EDA Tools. (K6)

CO4: Design Differential Amplifier and Ring oscillatorUsing130nm CMOS Technology with EDA Tools. (K6)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K6]	1	1	1	-	-	-	-	-	-	-	-	1	-	3	-	-
CO2 [K6]	-	1	1	-	-	-	-	-	-	-	-	-	3	3	-	-
CO3 [K6]	1	1	1	-	-	-	-	-	-	-	-	1	3	-	-	-
CO4 [K6]	-	1	-	-	-	-	-	-	-	-	-	1	-	3	-	-

Program Name: IV. B.Tech **Faculty Name: A.Ramesh**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	IV-I	**CAO**	**RT41044**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The student will

- Understand the fundamentals of different instruction set architectures and their relationship to the CPU design.
- Understand the principles and the implementation of computer arithmetic and ALU.
- Understand the memory system, I/O organization
- Understand the operation of modern CPUs including interfacing, pipelining, memory systems and busses.
- Understand the principles of operation of multiprocessor systems.

Course Outcomes:

Student able to:

CO1: Solve arithmetic operations: addition, subtraction, multiplication and division of Binary, BCD using algorithms.(K3)

CO2: Illustrate Addressing modes and Instruction codes of a processor.(K2)

CO3: Design a memory module and analyze its operation by interfacing with the CPU.(K6)

CO4: Discuss the set of specific instructions, design CPU with micro programmed control.(K6)

CO5: Design an I/O module and analyze its operation.(K6)

CO6: Apply design techniques using Pipeline and Vector Processing for a Given CPU organization,. (K3)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K3]	2	1	-	-	-	-	-	-	-	-	-	3	2	2	2	-
CO2 [K2]	-	1	-	-	-	-	-	-	-	-	-	-	1	1	1	-
CO3 [K6]	-	3	-	-	-	-	-	-	-	-	-	-	3	3	3	-
CO4 [K6]	-	3	-	-	-	-	-	-	-	-	-	-	3	3	3	-
CO5 [K6]	3	-	-	-	-	-	-	-	-	-	-	3	3	3	3	-
CO6 [K3]	2	-	-	-	-	-	-	-	-	-	-	3	2	2	2	-

Program Name: IV. B.Tech **Faculty Name: Sri. T. Durga Prasad**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	IV-I	CN	RT41042	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- The aim of this course is to introduce key concepts and principles of computer networks.
- The course will use a top-down approach to study the Internet and its protocol stack. Architecture, protocol, application-examples will include email, web and media-streaming. We will cover communications services (e.g., TCP/IP) required to support such network applications.
- The implementation and deployment of communications services in practical networks: including wired and wireless LAN environments, will be followed by a discussion of issues of network-security and network-management.
- Internet's architecture and protocols will be used as the primary examples to illustrate the fundamental principles of computer networking.

Course Outcomes:

Student able to:

CO1: Infer the OSI and TCP/IP Network models and identifying, different types of network topologies and protocols.(K2)

CO2: Analyze Physical layer Multiplexing techniques and switching techniques. (K4)

CO3: Analyze the Design issues and protocols of Data link layer. (K4)

CO4: Summarize the concepts Random Access, controlled Access protocols and Network layer routing functionalities. (K2)

CO5: Analyze the Transport Services, Connection management, TCP and UDP protocols; ATM AAL Layer protocol. (K4)

CO6: Infer the Application layer (WWW and HTTP) architecture and message formats and the wireless web. (K2)

POs' / COs'	**PO1 [k3]**	**PO2 [k4]**	**PO3 [k5]**	**PO4 [K5]**	**PO5 [K3]**	**PO6 [K3]**	**PO7 [K3]**	**PO8 [K3]**	**PO9 [K6]**	**PO10 [K2]**	**PO11 [K6]**	**PO12 [K1]**	**PSO1 [K3]**	**PSO2 [K3]**	**PSO3 [K3]**	**PSO4 [K2]**
CO1 [K2]	1	1	1	1	-	1	-	-	1	2	1	-	-	-	-	-
CO2 [K4]	3	2	1	1	-	3	-	-	1	3	1	-	-	-	-	-
CO3 [K4]	3	2	1	1	-	3	-	-	1	3	1	-	-	-	-	-
CO4 [K2]	1	1	1	1	-	1	-	-	1	2	1	-	-	-	-	-
CO5 [K4]	3	2	1	1	-	3	-	-	1	3	1	-	-	-	-	-
CO6 [K2]	1	1	1	1	-	1	-	-	1	2	1	-	-	-	-	-

Program Name: IV. B.Tech **Faculty Name: Sri. S. Pradeep Kumar**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	IV-I	**DIP**	**RT41043**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

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PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The student will

- Learn the fundamental concepts and applications of Digital Image Processing.
- Learn the concepts of and how to perform Intensity transformations and spatial filtering.
- Understand the relationship between Filtering in spatial and frequency domains,
- Understand the concepts of and how to perform Image restoration and reconstruction.
- Understand the concepts of different color models and Color image processing.

- Learn the concepts of Wavelets and multi-resolution processing, Image compression and Watermarking, Morphological image processing, Image segmentation, Representation and description.

Course Outcomes:

Student able to:

CO1: Distinguish different transforms on image useful for image processing applications.(K4)
CO2: Apply smoothing and sharpening operations on images in spatial and frequency domain. (K3)
CO3: Illustrate image restoration operations/techniques on images. (K2)
CO4: Learn effectively on color images and different color conversions on images. (K1)
CO5: Make use of wavelet transforms and compression methods to digital images which is required for storage and transmission. (K3)
CO6: Construct morphological operations on images and different image segmentation methods. (K6)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K4]	3	2	1	-	3	-	-	-	-	-	1	3	-	-	3	3
CO2 [K3]	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2	-
CO3 [K2]	1	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-
CO4 [K1]	1	1	-	-	1	-	-	-	-	-	1	-	-	1	1	1
CO5 [K3]	2	1	-	-	-	-	-	-	-	3	-	-	-	-	2	-
CO6 [K6]	3	3	3	3	3	3	-	-	-	-	2	-	-	3	3	3

Program Name: IV. B.Tech **Faculty Name: Smt. Ch. Amala**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	IV-I	**ELECTRONIC SWITCHING SYSTEMS**	**RT41048**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The student will be introduced to

- Understand the means of measuring traffic.
- Understand the implication of the traffic level on system design.

Course Outcomes:

CO1: Evaluate the time and space parameters of a switched signal

CO2: Establish the digital signal path in time and space between two terminals

CO3: Evaluate the inherent facilities within the system to test some of the SLIC, CODEC and Digital switch functions

CO4: Investigate the traffic capacity of the system

CO5: Evaluate the methods of collecting traffic data

CO6: Evaluate the method of interconnecting two separate digital switches

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K5]	3	3	2	-	-	-	-	-	-	-	-	-	-	-		-
CO2 [K6]	3	3	3	-	-	-	-	-	-	-	-	-	-	-		-
CO3 [K5]	-	3	2	-	-	-	-	-	-	-	-	3	-	-		-
CO4 [K4]	-	2	1	-	-	-	-	-	-	-	-	-	-	-		-
CO5 [K5]	-	3	2	-	-	-	-	-	-	-	-	3	-	-		-
CO6 [K5]	3	3	2	-	-	-	-	-	-	-	-	3	-	-		-

Program Name: IV. B.Tech **Faculty Name: Kum.N. Mounika**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	IV-I	**OC**	**RT4104A**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
85 Hrs	5	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

- The student will be introduced to the functionality of each of the components that comprise a fibre-optic communication system
- The properties of optical fibre that affect the performance of a communication link and types of fibre materials with their properties and the losses occur in fibbers.
- The principles of single and multi-mode optical fibbers and their characteristics
- Working of semiconductor lasers, and differentiate between direct modulation and external electro-optic modulation.
- Analyze the operation of LEDs, laser diodes, and PIN photo detectors (spectral properties, bandwidth, and circuits) and apply in optical systems.

- Analyze and design optical communication and fibre optic sensor systems.
- The models of analog and digital receivers.

Course Outcomes:

CO1: Analyze the properties of optical fiber that affect the performance of a communication link.(K4)

CO2: Discuss various fiber materials, different losses and dispersions that occur in optical fibers. (K6)

CO3: Estimate the functionality of fiber connectors and splices. (K5)

CO4: Analyze the operation of various optical sources and detectors. (K4)

CO5: Discuss Source to fiber power launching and Optical receiver operation. (K6)

CO6: Analyze optical communication by measuring Attenuation and Dispersion. (K4)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K4]	3	2	-	-	-	-	-	-	-	3	-	-	-	-	3	-
CO2 [K6]	3	3	-	-	-	-	-	-	-	3	-	-	-	-	3	-
CO3 [K5]	3	3	-	-	-	-	-	-	-	3	-	-	-	-	3	-
CO4 [K4]	3	2	-	-	-	-	3	-	-	3	-	-	-	-	3	-
CO5 [K6]	3	3	-	-	-	-	3	-	-	3	-	-	-	-	3	-
CO6 [K4]	3	2	1	-	-	-	3	-	-	3	-	-	-	-	3	-

Program Name: IV. B.Tech **Faculty Name: Smt. G. M. G. Madhuri**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	IV-I	**VLSI**	**RT41041**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The student will be introduced to

- Use mathematical methods and circuit analysis models in analysis of CMOS digital electronics circuits, including logic components and their interconnects.
- Learn the various fabrication steps of IC and come across basic electrical properties of MOSFET.
- Apply CMOS technology-specific layout rules in the placement and routing of transistors and interconnect and to verify the functionality, timing, power and parasitic effects.
- The concepts and techniques of modern integrated circuit design and testing (CMOS VLSI).
- Design static CMOS combinational and sequential logic at the transistor level, including mask layout.

Course Outcomes:

Student able to:

CO1: Demonstrate the fundamentals of IC technology such as various MOS fabrication technologies and IC production steps and electrical properties of MOS circuits.(K2)

CO2: Apply the Concept of NMOS and CMOS design rules to the layout of a circuit . (K3)

CO3: Explain basic circuit concepts and how it impacts scaling and performance. (K2)

CO4: Illustrate the considerations of subsystem design processes and Architectural issues. (K2)

CO5: Explain the concepts of VLSI design issues and current trends in semiconductor technology. (K2)

CO6: Explain FPGA architecture, configuration, configuration modes and step-by-step approach of FPGA design process. (K2)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	1	1	-	-	-	-	-	-	-	-	-	3	1	1	-	-
CO2 [K3]	-	1	-	-	-	-	-	-	-	-	-	3	2	2	-	-
CO3 [K2]	-	1	1	-	-	-	-	-	-	-	-	3	1	1	-	-
CO4 [K2]	-	1	-	-	-	-	-	-	-	-	-	3	1	1	-	-
CO5 [K2]	1	-	1	-	-	-	-	-	-	-	-	3	1	1	-	-
CO6 [K2]	1	-	-	-	-	-	-	-	-	-	-	3	1	1	-	-

Program Name: IV. B.Tech **Faculty Name:D.Suresh Babu/B. Praveen Kitti**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	IV-I	**MWE LAB**	**RT4104M**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hrs		3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The main objectives of the course is to impart

- To gain the practical hands-on-experience of various microwave sources& devices.
- To understand the concepts and principles of microwave engineering.
- To calculate scattering parameters of different microwave devices.
- To calculate different parameters of optical fiber link
- To differentiate the characteristics of LED and LASER

Course Outcomes:

Student able to:

CO1: Experiment simple microwave circuits and devices.(K3)

CO2: Demonstrate microwave equipment confidently and perform measurements.(K2)

CO3: Evaluate the performance of optical devices: light sources, fibres and detectors.(K5)

CO4: Compare the structural characteristics of different optical fibres with reference to losses.(K2)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K3]	2	1	-	1	-	-	-	-	-	-	-	-	-	-	2	3
CO2 [K2]	1	1	1	1	1	-	-	-	-	-	1	3	-	-	1	2
CO3 [K5]	3	3	-	-	-	-	-	-	-	-	-	3	-	-	3	3
CO4 [K2]	1	1	1	1	1	1	-	-	-	-	1	3	-	-	1	2

Program Name: IV. B.Tech **Faculty Name: Smt. G.M.G. Madhuri/A.Ramesh**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	IV-I	**VLSI LAB**	**RT4104L**	18-06-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
45 Hrs		3	3 Hrs	25	50	2

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

- Use mathematical methods and circuit analysis models in analysis of CMOS digital electronics circuits, including logic components and their interconnects.
- Apply CMOS technology-specific layout rules in the placement and routing of transistors and interconnect and to verify the functionality, timing, power and parasitic effects.
- Design static CMOS combinational and sequential logic at the transistor level, including mask layout.

Course Outcomes:

CO1: Design Inverter, Universal gates ,Full adder and Full subtractorusing130nm CMOS technology with EDA Tools.(K6)

CO2: Design RS – latch, D-latch and Asynchronous counterUsing130nm CMOS Technology with EDA Tools. (K6)

CO3: Design Static RAM Using130nm CMOS Technology with EDA Tools. (K6)

CO4: Design Differential Amplifier and Ring oscillatorUsing130nm CMOS Technology with EDA Tools. (K6)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K6]	1	1	1	-	-	-	-	-	-	-	-	1	-	3	-	-
CO2 [K6]	-	1	1	-	-	-	-	-	-	-	-	-	3	3	-	-
CO3 [K6]	1	1	1	-	-	-	-	-	-	-	-	1	3	-	-	-
CO4 [K6]	-	1	-	-	-	-	-	-	-	-	-	1	-	3	-	-

Program Name: IV. B.Tech **Faculty Name:** **Kum.N.Mounika**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	IV-II	**CMC**	**RT42041**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
70 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The student will be introduced to:

- Understand the basic cellular concepts like frequency reuse, cell splitting, cell sectoring etc., and various cellular systems.
- Understand the different types of interference s influencing cellular and mobile communications.
- Understand the frequency management, channel assignment and various propagation effects in cellular environment.
- Understand the different types antennas used at cell site and mobile.
- Understand the concepts of handoff and types of handoffs.
- Understand the architectures of GSM and 3G cellular systems.

Course Outcomes:

Student able to:

CO1: Infer the fundamentals of cellular radio system design, coverage capacity and can measure the C/I ratio.(K2)

CO2: Measure the path loss and co-channel interference. (K5)

CO3: Infer the antenna system design. (K2)

CO4: Explain about frequency management and channel assignment. (K5)

CO5: Explain about handoff mechanism. (K5)

CO6: Explain about GSM Architecture. (K5)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-
CO2 [K5]	3	1	3	2	2	-	-	-	-	-	-	-	-	-	-	-
CO3 [K2]	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-
CO4 [K5]	3	1	3	2	2	-	-	-	-	-	-	-	-	-	-	-
CO5 [K5]	1	1	3	2	2	-	-	-	-	-	-	-	-	-	-	-
CO6 [K5]	3	1	3	2	2	-	-	-	-	-	-	-	-	-	-	-

Program Name: IV. B.Tech **Faculty Name:** G. V. Ramanaiah

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	IV-II	EMI	RT42042	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The student will be able to

- Select the instrument to be used based on the requirements.
- Understand and analyze different signal generators and analyzers.
- Understand the design of oscilloscopes for different applications.
- Design different transducers for measurement of different parameters.

Course Outcomes:

CO1: Illustrate the performance characteristics of various instruments.(K2)

CO2: Analyze the parameters of signals using different signal generators and recorders.(K4)

CO3: Illustrate the operation and applications of CRO (normal and storage).(K2)

CO4: Analyze various AC bridges for the measurements of various physical quantities.(K4)

CO5: Select appropriate passive or active transducers for measurement of physical phenomenon.(K3)

CO6: Illustrate basics of data acquisition process and how different physical parameters like Pressure, velocity etc. can be measured.(K2)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	1	-	-		1	-		-	-	-	-	-	-	-	1	-
CO2 [K4]	3	2	-	1	3	-		-	-	-	-	-	-	-	3	-
CO3 [K2]	1	1	-	1	1	-	1	-	-	-	-	3	-	-	1	-
CO4 [K4]	3	2	-	1	3	-	3	-	-	-	-	3	-	-	3	-
CO5 [K3]	2	1	-	1	2	-	2	-	-	-	-	-	-	-	2	-
CO6 [K2]	1	1	-	1	1	-	1	-	-	-	-	-	-	-	1	-

Program Name: IV. B.Tech **Faculty Name: G.M.G.Madhuri**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	IV-II	**LPIC**	**RT42044C**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
66 Hrs	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

- The student will be able to understand the Fundamentals of Low Power VLSI Design.
- In this course, students can study low-Power Design Approaches, Power estimation and analysis.
- Another main object of this course is to motivate the graduate students to study and to analyze the Low-Voltage Low-Power Adders, Multipliers.
- The concepts of Low-Voltage Low-Power Memories and Future
- Trend and Development of DRAM.

Course Outcomes:

CO1: Explain the fundamentals of Low Power VLSI Design.(K2)

CO2: Explain the low power design approaches through Voltage scaling and through Switched capacitance minimization approaches. (K2)

CO3: Demonstrate the concepts of SPICE circuit simulators, Gate level Logic simulation and capacitive power estimation. (K2)

CO4: Design different Full adders circuits. (K6)

CO5: Design different multiplier circuits. (K6)

CO6: Explain SRAM , DRAM architectures, Sense Amplifiers. (K2)

POs' / COs'	PO1 [k3]	PO2 [k4]	PO3 [k5]	PO4 [K5]	PO5 [K3]	PO6 [K3]	PO7 [K3]	PO8 [K3]	PO9 [K6]	PO10 [K2]	PO11 [K6]	PO12 [K1]	PSO1 [K3]	PSO2 [K3]	PSO3 [K3]	PSO4 [K2]
CO1 [K2]	1	1	1	1	-	-	-	-	1	-	1	-	1	-	-	-
CO2 [K2]	1	1	1	1	-	-	-	-	1	-	1	-	1	-	-	-
CO3 [K2]	1	1	1	1	-	-	-	-	1	-	-	-	1	-	-	-
CO4 [K6]	-	3	3	3	-	-	-	-	2	-	2	-	3	-	-	-
CO5 [K6]	-	1	1	1	-	-	-	-	1	-	1	-	1	-	-	-
CO6 [K2]	-	1	1	1	-	-	-	-	1	-	1	-	1	-	-	-

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VIJAYAWADA - 520 001.
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Program Name: IV. B.Tech **Faculty Name:** **Smt. Ch. Amala**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	IV-II	**SATTLITE COMMUNICATIONS**	**RT42043A**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
72	4	-	3 Hrs	30	70	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

The student will be introduced to:

1. Understand the basic concepts, applications, frequencies used and types of satellite communications.
2. Understand the concept of look angles, launches and launch vehicles and orbital effects in satellite communications.
3. Understand the various satellite subsystems and its functionality.
4. Understand the concepts of satellite link design and calculation of C/N ratio.
5. Understand the concepts of multiple access and various types of multiple access techniques in satellite systems.

6. Understand the concepts of satellite navigation, architecture and applications of GPS. **Course Outcomes:**

Student able to:

CO1: Illustrate the basic concepts of satellite communication.(K2)
CO2: Learn various orbital effects on the communication system.(K1)
CO3: Illustrate the satellite sub system. (K2)
CO4: Develop various satellite links for specified C/N ratio. (K6)
CO5: explain the satellite equipment and LEO,MEO & GEO. (K2)
CO6: Illustrate the GPS system operation. (K2)

POs' / **COs'**	**PO1 [k3]**	**PO2 [k4]**	**PO3 [k5]**	**PO4 [K5]**	**PO5 [K3]**	**PO6 [K3]**	**PO7 [K3]**	**PO8 [K3]**	**PO9 [K6]**	**PO10 [K2]**	**PO11 [K6]**	**PO12 [K1]**	**PSO1 [K3]**	**PSO2 [K3]**	**PSO3 [K3]**	**PSO4 [K2]**
CO1 [K2]	1	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-
CO2 [K1]	1	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-
CO3 [K2]	1	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-
CO4 [K6]	3	3	3	-	-	-	-	-	-	-	-	-	-	-	3	-
CO5 [K2]	1	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-
CO6 [K2]	1	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-

Program Name: IV. B.Tech **Faculty Name:** **Smt. G.M.G. Madhuri**

Class	Semester	Title of The Paper	Paper Code	W.E.F
ECE	IV-II	**PROJECT**	**RT42045**	19-11-2018

.Total No.of Hours	Hours / Week		End Examination	Max Marks		Credits
	Theory	Practical		Internal	External	
180 Hrs	-	18	3 Hrs	60	140	3

Programme Outcomes:

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and concepts of Electronics & Communication Engineering to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using mathematics, natural sciences, and electronics and communication engineering principles.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and Electronics Design Automation tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The ECE Graduates will be Equipped with knowledge of complete design flow from specification to silicon in areas of both digital and analog VLSI Design and will be able to work in IC Design companies.

PSO2: The ECE Graduates will be trained with microprocessor and microcontroller based system design skills and can work as design and verification engineers in the area of Embedded Systems Design.

PSO3: The ECE Graduates will be able to apply engineering knowledge for design and implementation of projects pertaining to signal processing and Communications.

PSO4: The ECE Graduates will be incorporated with necessary soft skills, aptitude and technical skills to work in IT & Public sector.

Course Objectives:

Student able to

- To produce competent, creative and imaginative engineers.
- To promote a spirit of free and objective enquiry in different fields of knowledge.
- To create an intellectual reservoir to meet the growing demands of the nation.

Course Outcomes:

Student able to:

CO1: Identify the problem in the existing methodology for project work.(K3)
CO2: Discuss the technical and practical considerations of chosen problem in presentation.(K6)
CO3: Design the prescribed methodology in software or hardware. (K6)
CO4: Plan the project report as per recommended format. (K6)
CO5: Apply the possibility of publishing papers in peer reviewed journals/conference proceedings. (K3)

POs' / COs'	**PO1 [k3]**	**PO2 [k4]**	**PO3 [k5]**	**PO4 [K5]**	**PO5 [K3]**	**PO6 [K3]**	**PO7 [K3]**	**PO8 [K3]**	**PO9 [K6]**	**PO10 [K2]**	**PO11 [K6]**	**PO12 [K1]**	**PSO1 [K3]**	**PSO2 [K3]**	**PSO3 [K3]**	**PSO4 [K2]**
CO1 [K3]	2	1	1	1	2	2	2	2	1	3	1	-	2	2	2	3
CO2 [K6]	3	2	3	3	3	3	3	3	2	3	2	-	3	3	3	3
CO3 [K6]	3	3	3	3	3	3	3	3	2	3	2	-	3	3	3	3
CO4 [K6]	3	3	3	-	3	3	3	3	2	3	2	-	3	3	3	3
CO5 [K3]	2	1	1	-	2	2	2	2	1	3	1	-	2	2	2	3

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Program Name: CIVIL　　　　　　　　　　　　Faculty Name:Sd.Parveen

Class	Semester	Title of The Paper	Paper Code	W.E.F
II CIVIL	I	Probability & Statistics	R1621011	11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 6	Practical ----	3 Hours	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Recall probability of event(s) and expectation(s) of random variable(s) for elementary problems, gets knowledge of probability distributions such as Normal distributions
2. Understand the Uniqueness of probability distributions.
3. Design and conduct experiments, as well as to analyze and interpret data for engineering problems
4. Apply hypothesis testing procedure and carryout appropriate tests to checks its acceptability
5. Analyze correlation between variables and find the mathematical relation between them.
6. Evaluate various types of control charts in Quality Improvement.

Course Objectives:

1. Acquire knowledge in various types of probability distributions and gain knowledge of modeling in the presence of uncertainties.
2. Learn properties and nature of probability distributions
3. Study elementary concepts in sampling theory, and the use of statistical inference in practical data analysis.
4. Aware of principle steps in hypothesis testing, and use of statistics in decision making.
5. Know how to use computers and/or calculators for statistical analysis of relationship between/among variables.
6. Obtain Process quality through control charts, and improve Statistical skills.

SYLLABUS:

UNIT-I: Random variables and Distributions

Introduction – Random variables – Distribution function – Discrete distributions: Review of Binomial and Poisson distributions – Continuous distributions: Normal distribution, Normal approximation to Binomial distribution, Gamma and Weibull distributions.

UNIT-II: Moments and Generating functions

Introduction – Mathematical expectation and properties – Moment generating function – Moments of standard distributions: Binomial, Poisson, and Normal distributions – Properties

UNIT-III: Sampling Theory

Introduction – Population and samples – Sampling distribution of mean for large samples and small samples (with known and unknown variance) – Proportion sums and differences of means – Sampling distribution of variance - Point and interval estimators for means and proportions.

UNIT-IV: Tests of Hypothesis

Introduction – Type I and Type II errors – Maximum error - One tail, two-tail tests – Tests concerning one mean and proportion, two means – proportions and their differences using Z-test – Student's t-test – F-test and Chi-square (χ^2) test – ANOVA for one-way and two-way classified data.

UNIT-V: Curve fitting and Correlation

Introduction – Fitting a Straight line – Second degree curve – Exponential curve – Power curve by method of least squares.

Simple Correlation and Regression – Rank Correlation – Multiple regression.

UNIT-VI: Statistical Quality Control Methods

Introduction – Methods for preparing control charts – Problems using x-bar, p, R charts and attribute charts.

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: CIVIL Faculty Name: K.Narendra

Class	Semester	Title of The Paper	Paper Code	W.E.F
II CIVIL	I	BEEE	R1621012	11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 6	Practical ----	3 Hours	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Describe different types of laws and networks and analyse various electrical networks.
2. Discuss principle of operation, types of DC Machine, analyse output equations, applications, speed control methods and predict efficiency by Swinburne's Test.
3. Explain the principle of operation of single phase transformer, emf equation and predict losses, efficiency and regulation.
4. Express principle of operation of alternator and 3-phase induction motors and predict the efficiency and regulation.
5. Classify different types of diodes, operational amplifiers and analyse the characteristics with their applications.
6. Recognize PNP and NPN transistors and illustrate their applications as an amplifiers.

Course Objectives:

1. Learn basic principles of electrical law's and analysis of networks.
2. Know the principle of operation and construction details of DC machines.
3. Understand the principle of operation and construction details of transformer.
4. Know the principle of operation and construction details of alternator and 3-Phase induction motor.
5. Study the operation of PN junction diode, half wave, full wave rectifiers and OP-AMPs.
6. Learn the operation of PNP and NPN transistors and variousamplifiers.

SYLLABUS:

UNIT – I, ELECTRICAL CIRCUITS:
Basic definitions, Types of network elements, Ohm's Law, Kirchhoff's Laws, inductive networks, capacitive networks, series, parallel circuits and star-delta and delta-star transformations.

UNIT – II, DC MACHINES:
Principle of operation of DC generator – emf equation - types – DC motor types –torque equation – applications – three point starter, swinburn's Test, speed control methods.

UNIT – III, TRANSFORMERS:
Principle of operation of single phase transformers – e.m.f equation – losses –efficiency and regulation.

UNIT – IV, AC MACHINES: Principle of operation of alternators – regulation by synchronous impedance method –principle of operation of 3-Phase induction motor – slip-torque characteristics - efficiency – applications.

UNIT V, RECTIFIERS & LINEAR ICs: PN junction diodes, diode applications (Half wave and bridge rectifiers). Characteristics of operation amplifiers (OP-AMP) - application of OP-AMPs(inverting, non inverting, integrator and differentiator).

UNIT VI, TRANSISTORS: PNP and NPN junction transistor, transistor as an amplifier, single stage CE Amplifier, frequency response of CE amplifier, concepts of feedback amplifier.

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: CIVIL Faculty Name:S.Naga Bhargavi

Class	Semester	Title of The Paper	Paper Code	W.E.F
II CIVIL	I	Strength of Materials-I	R1621013	11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 6	Practical ----	3 Hours	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Determine Stress, Strain & Strain Energy in Uniform, Varying cross section and Composite Bars.
2. Sketch Shear Force & Bending Moment diagrams, for different beams subjected to various types of loading.
3. Derive the equation of bending, Determination of bending stresses in beams of various cross sections for different loading conditions; Design of simple beams.
4. Determine Shear stresses in beams for different cross sections and its distribution.
5. Determine slope & deflection in beams of different cross sections and end conditions for various types of loading using different methods.
6. Estimate stresses and strains in Thin & Thick Cylinders and Spherical shells.

Course Objectives:

1. Learn preliminary concepts of Strength of Materials, Principles of Elasticity and Plasticity, Stress strain, behavior of materials and their governing laws ,relationship between elastic constants with poisons ratio and strain energy
2. Understand the concepts of Bending Moment and Shear force in beams with different boundary and loading conditions and to draw the shear force and bending moment diagrams.
3. To understand concepts of bending (Flexural) stresses developed , bending equations, calculation of section modulus for different beam cross sections.
4. To understand concepts of Shear stresses developed for different beam sections, shear centre.
5. To learn the concept of deflection and slope in beams under various loading and support conditions with different methods.
6. To understand the concepts of classification of cylinders, spherical shells and to derive equations for measurement of stresses and strains across the cross section when subjected to internal pressure.

SYLLABUS:

UNIT – I: Simple Stresses And Strains And Strain Energy: Elasticity and plasticity – Types of stresses and strains – Hooke's law – stress – strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain – Elastic moduli and the relationship between them – Bars of varying section – composite bars – Temperature stresses.
Strain Energy – Resilience – Gradual, sudden, impact and shock loadings – simple

applications.

UNIT- II : Shear Force And Bending Moment: Definition of beam – Types of beams – Concept of shear force and bending moment – S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads, u.d.l., uniformly varying loads and combination of these loads – Point of contraflexure – Relation between S.F., B.M and rate of loading at a section of a beam

UNIT – III: Flexural Stresses: Theory of simple bending – Assumptions – Derivation of bending equation: M/I = f/y = E/R, Neutral axis – Determination bending stresses – section modulus of rectangular and circular sections (Solid and Hollow), I, T, Angle and Channel sections – Design of simple beam sections.

UNIT –IV: Shear Stresses: Derivation of formula – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T angle sections, built up beams, shear centre.

UNIT – V: Deflection Of Beams: Bending into a circular arc – slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, - U.D.L. Uniformly varying load. Mohr's theorems – Moment area method – application to simple cases including overhanging beams.

UNIT – VI: Thin And Thick Cylinders: Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in diameter, and volume of thin cylinders – Thin spherical shells.

Thick Cylinders: Introduction Lame's theory for thick cylinders – Derivation of Lame's formulae – distribution of hoop and radial stresses across thickness – design of thick cylinders – compound cylinders – Necessary difference of radii for shrinkage – Thick spherical shells.

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College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: Faculty Name:

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	I	BMC	R1621014	11-6-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3 HOURS	Internal	External	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

COURSE OBJECTIVES

1. Gain the knowledge on stones, bricks and tiles
2. Attain the concept of masonry and knowledge on timber
3. Define the properties of lime, cement, concrete
4. Get idea on components of the building
5. Know about the finishing process in the building construction.
6. Illustrate the properties of aggregates

COURSE OUTCOME

1. Select appropriate building materials like stones, bricks and tiles in the present day constructions for various applications.
2. Identify the type of Masonry and judge the timber to be used in construction activities
3. Specify the properties of lime, cement and concrete and its manufacturing process
4. Recognize and Distinguish the building components
5. Distinguish different types of finishing process and their applications
6. Judge the suitability of aggregates

Unit-I: **STONES BRICKS AND TILES**

Properties of building stones – relation to their structural requirements, classification of stones – Stone quarrying – precautions in blasting, dressing of stone, Composition of good brick earth, various methods of manufacturing of bricks, Characteristics of good tile - manufacturing methods, types of tiles. Uses of materials like Aluminum, Gypsum, Glass and Bituminous materials – their quality.

Unit-II: **MASONRY**

Types of masonry, English and Flemish bonds, Rubble and Ashlar Masonry. Cavity and partition walls.

WOOD: Structure – Properties- Seasoning of timber- Classification of various types of woods used in buildings- Defects in timber. Alternative materials for wood – Galvanized Iron, Fiver – Reinforced Plastics, Steel, Aluminum.

Unit-III: LIME AND CEMENT

LIME: Various ingredients of lime – Constituents of lime stone –classification of lime – various methods of manufacture of lime.

CEMENT: Portland cement- Chemical Composition – Hydration, setting and fineness of cement. Various types of cement and their properties. Various field and laboratory tests for Cement. Various ingredients of cement concrete and their importance – various tests for concrete.

Unit-IV: BUILDING COMPONENTS

Lintels, arches, vaults, stair cases – types. Different types of floors –Concrete, Mosaic, and Terrazzo floors, Pitched, flat roofs. Lean to roof, Coupled Roofs. Trussed roofs – King and Queen post Trusses. R.C.C Roofs, Madras Terrace and Pre-fabricated roofs.

Unit-V: FINISHINGS

Damp Proofing and water proofing materials and uses – Plastering Pointing, white washing and distempering.

Paints: Constituents of paint – Types of paints – Painting of new/old wood- Varnish.

Form Works and Scaffoldings

Unit-VI: AGGREGATES

Classification of aggregate – Coarse and fine aggregates- particle shape and texture – Bond and Strength of aggregate–Specific gravity – Bulk Density, porosity and absorption – Moisture content of Aggregate-Bulking of sand – Sieve analysis.

HOD CIVIL DEPT.
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College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: B.Tech in Civil Engineering   Faculty Name: T.S.V.DURGA

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	1	Surveying	R1621015	11-6-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem** research literature, and analyze complex engineering problems reaching substantiated **analysis** Identify, formulate, conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues

2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Illustrate the Principles and classification of Surveying.

2. Identify corrections to Linear Measurements & bearings. Analyze the Omitted Measurements in Traversing

3. Recognize the concept of leveling and practice the methods of leveling and contours.

4. Summarize the working of Theodolite by using trigonometric leveling and tacheometry

5. Design of Curves and define the importance of Total station and GPS

6. Evaluate the areas of boundaries and volumes of earthwork by various methods.

Course Objectives:

1.Definethe basic Principles of Surveying and discuss the Classification.

2.Memorize corrections to Linear Measurements & bearings. Calculation of Omitted Measurements in Traversing.

3.Discusswith Concept of leveling, methods of leveling and illustrate the characteristics of contours, methods and.

4. illustratewith function of Theodolite, Learn the methods of trigonometric leveling tachometry.

5.Developand setting out of horizontal curves, recognize the importance of Total station and GPS

6.**Evaluate the areas of regular and irregular boundaries and volumes [of earthwork] by various methods.**

UNIT – I

INTRODUCTION: definition-Uses of surveying- overview of plane surveying (chain, compass and plane table), Objectives, Principles and classifications – Errors in survey measurements.

UNIT – II

DISTANCES AND DIRECTION: Distance measurement conventions and methods; use of chain and tape, Electronic distance measurements (EDM)-principles of electro optical EDM-errors and corrections to linear
Measurements - compass survey - Meridians, Azimuths and Bearings, declination, computation of angle. Traversing - Purpose-types of traverse-traverse computation – traverse adjustments - omitted measurements.

UNIT – III

LEVELING AND CONTOURING: Concept and Terminology, Leveling Instruments and their Temporary and permanent adjustments- method of leveling. Characteristics and Uses of contours- methods of conducting
Contour surveys and their plotting.

UNIT – IV

THEODOLITE: Theodolite, description, principles-uses and adjustments – temporary and permanent, measurement of horizontal and vertical angles. Principles of Electronic Theodolite - Trigonometrical leveling,.
TACHEOMETRIC SURVEYING: Stadia and tangential methods of Tacheometry. Distance and Elevation formulae for Staff vertical position.

UNIT – V

Curves: Types of curves, design and setting out – simple and compound curves- transition curves. Introduction to geodetic surveying, Total Station and Global positioning system.

UNIT – VI

COMPUTATION OF AREAS AND VOLUMES: Area from field notes, computation of areas along irregular boundaries and area consisting of regular boundaries. Embankments and cutting for a level section and two
Level sections with and without transverse slopes, determination of the capacity of reservoir, volume of barrow pits.

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
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POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO
COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: CIVIL Faculty Name: K.V.Lakshmi Narayana

Class	Semester	Title of The Paper	Paper Code	W.E.F
II CIVIL	I	Fluid Mechanics	R1621016	11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 6	Practical ----	3 Hours	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Listout Physical properties of fluids andAppraise pressure by applying Pascal's and Hydrostatic Laws
2. Solve total pressure, centre of pressure for various plane surfaces and Evaluate Velocity components by applying velocity potential & Stream functions
3. Apply Euler’s, Bernoulli’s & Impulse momentum equations on pipe bends
4. Evaluate Boundary layer thickness, Drag & Lift forces on submerged bodies and Create Vonkarmen momentum integral equation
5. Define Laminar & Turbulent flows, Major & Minor losses, TEL & HGL & Moody’s chart. Design of pipe networks
6. Estimate the discharge and velocity by using Venturimeter, Orifice meter &Pitot tube in Pipe flows, Notches & Weirs across canals.

Course Objectives:

1. Study Physical properties of fluids, Pascal’s law, Hydrostatic law & different Pressure measuring devices.
2. Learn classification of Fluid flow, Hydrostatic forces on submerged plane surfaces, Continuity equation and flow net analysis.
3. Familiarize the concept of Navier -Stokes, Bernoulli’s, Euler’s and Impulse momentum equations on a Pipes & Pipe bend.
4. Study the Characteristics of Boundary layer along a thin flat plate, Derive Vonkarmen momentum integral equation, concept of drag & lift.
5. Learn laws of fluid friction, Reynold’s experiment, major loss by Darcy’s equation & minor losses in pipe flow. TEL & HGL, Moody’s Chart & to design pipe networks.
6. Determine the Velocity by Pitot tube & Discharge of flow through Channels & pipes by & Notches, Weirs &Venturimeter, Orifice meter.

SYLLABUS:

UNIT I

INTRODUCTION : Dimensions and units – Physical properties of fluids specific gravity, viscosity, surface tension, vapor pressure and their influences on fluid motion, pressure at a point, Pascal’s law, Hydrostatic law - atmospheric, gauge and vacuum pressure- measurement of pressure. Pressure gauges, Manometers: Differential and Micro Manometers.

UNTI – II

Hydrostatic forces on submerged plane, Horizontal, Vertical, inclined and curved surfaces – Center of pressure. Derivations and problems.

UNTI – III

FLUID KINEMATICS: Description of fluid flow, Stream line, path line and streak lines and stream tube. Classification of flows: Steady, unsteady, uniform, non-uniform, laminar, turbulent, rotational and irrotational flows – Equation of continuity for one, two , three dimensional flows – stream and velocity potential functions, flow net analysis.

UNIT – IV

FLUID DYNAMICS: Surface and body forces – Euler's and Bernoulli's equations for flow along a stream line for 3-D flow, Navier – Stokes equations (Explanationary) Momentum equation and its application – forces on pipe bend.

UNIT – V

Approximate Solutions of Navier-Stoke's Equations – Boundary layer – concepts, Prandtl contribution, Characteristics of boundary layer along a thin flat plate, Vonkarmen momentum integral equation, laminar and turbulent Boundary layers, no deviations BL in transition, separation of BL, Control of BL, flow around submerged objects-Drag and Lift- Magnus effect.

UNIT – VI

Reynold's experiment – Characteristics of Laminar & Turbulent flows. Flow between parallel plates, Flow through long tubes, flow through inclined tubes.

UNIT – VII

CLOSED CONDUIT FLOW: Laws of Fluid friction – Darcy's equation, Minor losses – pipes in series – pipes in parallel – Total energy line and hydraulic gradient line. Pipe network problems, variation of friction factor with Reynold's number – Moody's Chart.

UNIT – VIII

MEASUREMENT OF FLOW: Pitot tube, Venturi meter and Orifice meter – classification of orifices, flow over rectangular, triangular and trapezoidal and Stepped notches - –Broad crested weirs.

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VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: B.Tech in Civil Engineering   Faculty Name: T.S.V.DURGA

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	1	Surveying Field work-I	R1621017	11 – 6-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
45 Hours	Theory	Practical 3	3	Internal 25	External 50	2

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem** research literature, and analyze complex engineering problems reaching substantiated **analysis** Identify, formulate, conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues

2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Experiment the chain surveying in the field of civil engineering applications such as road profile & Area calculations.

2. Appraise the principle of compass surveying for distance and angle measurement.

3. Sketch the plan of site.

4. Evaluate the R.L of unknown point and draw the longitudinal & contours.

Course Objectives:

1. Familiarize with instruments used in chain survey.
2. Learn the direction measurement Using compass.
3. Understand the concept of plane table surveying.
4. Familiarize with different methods of leveling.

Course Syllabus:

1. Survey by chain survey of road profile with offsets in case of road widening.

2. Survey in an area by chain survey (Closed circuit).

3. Determination of distance between two inaccessible points by using compass.

4. Finding the area of the given boundary using compass (Closed Traverse).

5. Plane table survey : finding the area of a given boundary by the method of Radiation.

6. Plane table survey : finding the area of a given boundary by the method of intersection.

7. Two Point Problem by the plane table survey.

8. Fly leveling: Height of the instrument method (differential leveling) .

9. Fly leveling: rise and fall method.

10. Fly leveling: closed circuit/ open circuit.

HOD CIVIL DEPT.
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College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: CIVIL Faculty Name:S.Naga Bhargavi

Class	Semester	Title of The Paper	Paper Code	W.E.F
II CIVIL	I	Strength of Materials LAB	R1621018	11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
40 Hours	Theory 0	Practical 3	3 Hours	Internal 25	External 50	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Determine Ultimate Tensile, Shear, Compressive & Impact strength of the given Specimen
2. Determine the Deflection, Young's Modulus &validation of Maxwell's reciprocal theorem
3. Determine the Shear Modulus for the Springs & Shafts.
4. Determine the Surface Hardness of the given material.

Course Objectives:

1. Acquire knowledge aboutthe mechanical properties of materials.
2. Acquire knowledge about Deflection & Young'sModulus of the material of given beam
3. Acquire knowledge about Shear Modulus of the Specimens.
4. Acquire knowledge about Surface Hardness of the given material.

SYLLABUS:

List of Experiments

1. Tension test on Steel bar
2. Bending test on (Steel / Wood) Cantilever beam.
3. Bending test on simple support beam.
4. Torsion test
5. Hardness test
6. Spring test
7. Compression test on wood or concrete
8. Impact test
9. Shear test
10. Verification of Maxwell's Reciprocal theorem on beams.
11. Use of Electrical resistance strain gauges

Continuous beam – deflection test

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VIJAYAWADA - 520 001.
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Program Name: CIVIL Faculty Name: Syed Imran

Class	Semester	Title of The Paper	Paper Code	W.E.F
III CIVIL	I	Engineering Geology	R1631012	11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 6	Practical ----	3 Hours	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
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10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Define the importance of geology in civil engineering and weathering process of rocks
2. Identify the physical properties various Minerals and Rocks
3. Recognize various secondary structures and their importance in civil engineering point of view.
4. Discuss the knowledge on Ground water, Earthquakes, landslides.
5. Choose the suitable required geophysical method for solving various geological problems and Define Engineering properties of rocks
6. Describe the importance of Geology in construction of Dams, Reservoirs and tunnels

Course Objectives:

1. Acquire knowledge on importance of Engineering geology with their branches in Civil Engineering point of view
2. Classify various types of minerals, rocks by the study of their physical properties
3. Obtain the knowledge on Structural geology and their importance in Civil Engineering point of view
4. Understand the concepts of Ground water ,Earthquakes and Landslides with their types
5. Know the Importance and Classification about Geophysical study
6. Discuss about various dams and effects of tunneling, reservoirs.

SYLLABUS:

UNIT-I: Introduction: Branches of Geology, Importance of Geology in Civil Engineering with case studies

Weathering: Weathering of rocks, Geological agents, weathering process of Rock, River process and their development.

UNIT-II Mineralogy And Petrology: Definitions of mineral, Structures of silicates and rock, Different methods of study of mineral and rock, The study of physical properties of minerals and rocks for megascopic study for the following minerals and rocks, Common rock forming minerals are Feldspar, Quartz Group, Olivine, Augite, Hornblende, Mica Group, Asbestos, Talc, Chlorite, Kyanite, Garnet, Calcite and other ore forming minerals are Pyrite, Hematite, Magnetite, Chlorite, Galena, Pyrolusite, Graphite, Chromite, Magnetite And Bauxite. Classification, structures, textures and forms of Igneous rocks, Sedimentary rocks, Metamorphic rocks, and their megascopic study of granite varieties, (pink, gray, green). Pegmatite, Dolerite, Basalt etc., Shale, Sand Stone, Lime Stone, Laterite, Quartzite, Gneiss, Schist, Marble, Khondalite and Slate and their importance in Civil Engineering.

UNIT-III Structural Geology: Strike, Dip and Outcrop study of common geological structures associating with the rocks such as Folds, Faults, Joints and Unconformities- parts, types, mechanism and their importance in Civil Engineering–Indian stratigraphy. Aims of statigrtaphy, Principles, Geological time scour, Geological division in India, Major stratigraphic units in India.

UNIT-IV Ground Water: Water table, Cone of depression, Geological controls of Ground Water Movement, Ground Water Exploration Techniques.
Earthquakes And Land Slides: Terminology, Classification, causes and effects, Shield areas and Seismic bells, Richter scale intensity, Precautions of building constructions in seismic areas. Classification of Landslides, Causes and Effects, measures to be taken prevent their occurrence at Landslides. Case studies.

UNIT-V Geophysics: Importance of Geophysical methods, Classification, Principles of Geophysical study by Gravity method, Magnetic method, Electrical methods, Seismic methods, Radiometric method and Electrical resistivity, Seismic refraction methods and Engineering properties of rocks.

UNIT-VI Geology of Dams, Reservoirs And Tunnels: Types and purpose of Dams, Geological considerations in the selection of a Dam site. Life of Reservoirs Purpose of Tunnelling, effects, Lining of Tunnels. Influence of Geology for successful Tunnelling.

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Program Name: B.Tech Faculty Name: K.Prudhvi

Class	Semester	Title of The Subject	Subject Code	W.E.F
III	I	DDRCS	R1631014	11-6-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	06		3	30	70	3

Programme Outcomes:

PO1: Engineering Knowledge: Apply knowledge of mathematics and science, with fundamentals of Computer Science & Engineering to be able to solve complex engineering problems related to CSE.

PO2: Problem Analysis: Identify, Formulate, review research literature and analyze complex engineering problems related to CSE and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3: Design/Development of solutions: Design solutions for complex engineering problems related to CSE and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.

PO4: Conduct Investigations of Complex problems: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to computer science related complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the CSE professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the CSE professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply Ethical Principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

• Familiarize Students with different types of design philosophies

• Equip student with concepts of design of flexural members

• Understand Concepts of shear, bond and torsion

• Familiarize students with different types of compressions members and Design

• Understand different types of footings and their design

Course Outcomes:

• Work on different types of design philosophies

• Carryout analysis and design of flexural members and detailing

• Design structures subjected to shear, bond and torsion

• Design different type of compression members and footings

Syllabus Unit Wise:

UNIT –I Introduction:
a) **Working stress method**: Design codes and handbooks, loading standards – Dead, live, wind and earthquake loads, Elastic theory: design constants, modular ratio, neutral axis depth and moment of resistance for balanced, under-reinforced and over-reinforced sections. Design of singly and doubly reinforced beams.
b) Limit State Design: Concepts of limit state design – Basic statistical principles – Characteristic loads –Characteristic strength – Partial load and safety factors – representative stress-strain curves for cold worked deformed bars and mild steel bars. Assumptions in limit state design – stress - block parameters – limiting moment of Resistance.
All units i.e. from unit II to unit VI are to be taught in Limit State Design.
UNIT –II Design for Flexure: Limit state analysis and design of singly reinforced sections effective depth- Moment of Resistance- Doubly reinforced and flanged (T and L) beam sections- Minimum depth for a given capacity- Limiting Percentage of Steel- Minimum Tension Reinforcement-Maximum Flexural Steel- Design of Flanged Sections (T&L)-
UNIT – III Design for Shear, Torsion and Bond: Limit state analysis and design of section for shear and torsion – concept of bond, anchorage and development length, I.S. code provisions. Design examples in simply supported and continuous beams, detailing.

Limit state design for serviceability: Deflection, cracking and code provision, Design of formwork for beams and slabs.
UNIT – IV Slabs: Classification of slabs, design of one - way slabs, one way continuous slab using IS Coefficients (Conventional) –Design of two - way slabs-simply supported and various edge conditions using IS Coefficients .
UNIT – V Design of Compression members: Effective length of a column, Design of short and long columns – under axial loads, uniaxial bending and biaxial bending – Braced and unbraced columns – I S Code provisions.
UNIT –VI

Footings: Different types of footings – Design of isolated footings – pedestal, square, rectangular and circular footings subjected to axial loads, uni-axial and bi-axial bending moments.

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Program Name: CIVIL   Faculty Name: S.Naga Bhargavi

Class	Semester	Title of The Paper	Paper Code	W.E.F
III CIVIL	I	Structural Analysis-II	R1631013	11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	6	----	3 Hours	30	70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Evaluate the forces, moment and effect of temperature on arches.
2. Appraise the forces and moments in beams and columns.
3. Evaluate the forces, moment and effect of temperature in Cable and Suspension Bridge structures.
4. Appraise Beams and Frames using Moment Distribution Method.
5. Appraise Beams and Frames using Kani's Method.
6. Appraise Beams using Matrix Methods..

Course Objectives:

1. Learn how to analyze different thrust's, Bending moment and temperature effects for different arches.
2. Familiarize the concepts of lateral load analysis and its application to building frames.
3. Study the concepts of analysis of cable and suspension bridges for different loading conditions and temperature stresses.
4. Study the concept of analysis of structural elements by using Moment distribution method.
5. Learn how to evaluate shear force and bending moment by using Kani's method.
6. Study the concept of Matrix methods of analysis (Flexibility & Stiffness methods).

SYLLABUS:

UNIT I Three Hinged Arches: Elastic theory of arches – Eddy's theorem – Determination of horizontal thrust, bending moment, normal thrust and radial shear – effect of temperature. Hinges with supports at different levels.
Two Hinged Arches: Determination of horizontal thrust, bending moment, normal thrust and radial shear – Rib shortening and temperature stresses, Tied arches – Fixed arches – (No analytical question).

UNIT-II, Lateral Load Analysis Using Approximate Methods: application to building frames. (i) Portal Method (ii) Cantilever Method.

UNIT – III, Cable Structures and Suspension Bridges: Introduction, characteristics of cable, analysis of cables subjected to concentrated and uniformly distributed loads, anchor cable, temperature stresses, analysis of simple suspension bridge, three hinged and two hinged stiffening girder suspension bridges.

UNIT – IV Moment Distribution Method: Stiffness and carry over factors – Distribution factors – Analysis of continuous beams with and without sinking of supports – Portal frames – including Sway-Substitute frame analysis by two cycle.

UNIT – V Kani's Method: Analysis of continuous beams – including settlement of supports and single bay portal frames with and without side sway.

UNIT – VI Introduction to Matrix Methods: Flexibility methods: Introduction, application to continuous beams (maximum of two unknowns) including support settlements. Stiffness method: Introduction, application to continuous beams (maximum of two unknowns) including support settlements.

HOD CIVIL DEPT.
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Program Name: B.Tech Faculty Name: B.Swetha Malika

Class	Semester	Title of The Subject	Subject Code	W.E.F
III	I	Transportation Engineering -II	R1631015	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	06		3	30	70	3

Programme Outcomes:

PO1: Engineering Knowledge: Apply knowledge of mathematics and science, with fundamentals of Computer Science & Engineering to be able to solve complex engineering problems related to CSE.

PO2: Problem Analysis: Identify, Formulate, review research literature and analyze complex engineering problems related to CSE and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3: Design/Development of solutions: Design solutions for complex engineering problems related to CSE and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.

PO4: Conduct Investigations of Complex problems: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to computer science related complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the CSE professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the CSE professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

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PO9: Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

1. Know the components and functions of a railway track.
2. Learn the design principles of railway geometrics
3. Learn the types of Turnouts and signals.
4. Study the concept of Airport planning and design
5. Learn the design principles of Airport Runway
6. Know the concept of Docks and harbours

Course Outcomes:

1. Define the Components of Railway Track
2. Design geometrics of Railway Track
3. Choose suitable methods for the effective movements of trains
4. Plan an Airport for the given area
5. Design of Airfield pavements & maintenance
6. Describe the concept of Docks and Harbours

Course Syllabus Unit Wise:

A.RAILWAY ENGINEERING

UNIT – I : Components of Railway Engineering: Permanent way components – Railway Track Gauge – Cross Section of Permanent Way – Functions of various Components like Rails, Sleepers and Ballast –Rail Fastenings – Creep of Rails- Theories related to creep – Adzing of Sleepers- Sleeper density – Rail joints.

UNIT – II : Geometric Design of Railway Track: Alignment – Engineering Surveys – Gradients- Grade Compensation- Cant and Negative Super elevation- Cant Deficiency – Degree of Curve – safe speed on curves – Transition curve – Compound curves – Reverse curves – Extra clearance on curves – widening of gauge on curves – vertical curves – cheek rails on curves.

UNIT – III: Turnouts & Controllers: Track layouts – Switches – Design of Tongue Rails – Crossings – Turnouts – Layout of Turnout – Double Turnout – Diamond crossing – Scissors crossing. Signal Objectives – Classification – Fixed signals – Stop signals – Signalling systems – Mechanical signalling system – Electrical signalling system – System for Controlling Train Movement – Interlocking – Modern signalling Installations.

B.AIRPORT ENGINEERING

UNIT – IV : Airport Planning & Design: Airport Master plan – Airport site selection – Air craft characteristics – Zoning laws – Airport classification – Runway orientation – Wind rose diagram – Runway length – Taxiway design – Terminal area and Airport layout – Visual aids and Air traffic control.

UNIT – V : Runway Design: Various Design factors – Design methods for Flexible pavements – Design methods for Rigid pavements – LCN system of Pavement Design – Airfield Pavement Failures – Maintenance and Rehabilitation of Airfield pavements – Evaluation & Strengthening of Airfield pavements – Airport Drainage – Design of surface and subsurface drainage.

C. DOCKS & HARBOURS

UNIT – VI : Planning, Layout, Construction & Maintenance Of Docks & Harbours: Classification of ports – Requirement of a good port – classification of Harbours – Docks – Dry & wet docks – Transition sheds and workhouses – Layouts; Quays – construction of Quay walls – Wharves – Jetties – Tides – Tidal data and Analysis – Break waters – Dredging – Maintenance of Ports and Harbours – Navigational aids.

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Program Name: B.Tech Faculty Name: T.Mutyala Raju

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	I	Concrete Technology Lab	R163106	11-6-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
48 Hours	Theory -	Practical 3	3	Internal 25	External 50	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
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9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.

2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

1. Evaluate properties of cement
2. Assess properties of aggregates.
3. Test properties of concrete in fresh state.
4. Determine properties of concrete in hardened state

Course Outcomes:

1. Measure properties of cement
2. Test properties of aggregates
3. Determine properties of concrete in fresh state
4. Test properties of concrete in hardened state

List of Experiments

1. Determination of normal Consistency and fineness of cement.
2. Determination of initial setting time and final setting time of cement.
3. Determination of specific gravity and soundness of cement.
4. Determination of compressive strength of cement.
5. Dtermination of grading and fineness modulus of Coarse aggregate by
6. sieve analysis.
7. Determination of specific gravity of coarse aggregate
8. Determination of grading and fineness modulus of fine aggregate (sand)

9. by sieve analysis.

10. Determination of bulking of sand.

11. Determination of workability of concrete by compaction factor method.

12. Determination of workability of concrete by slump test

13. Determination of workability of concrete by Vee-bee test.

14. Determination of compressive strength of cement concrete and its

15. young‟s modulus.

16. Determination of split tensile strength of concrete.

17. Non-Destructive testing on concrete (for demonstration)

HOD CIVIL DEPT.
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Program Name: B. Tech in Civil Engineering **Faculty Name:**U.Krishna Sainath

Class	Semester	Title of The Paper	Paper Code	W.E.F
III Year	I Semester	Geology Lab	R163107	11-6-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
48 Hours	Theory -	Practical 3	3	Internal 25	External 50	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.

2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

The student will:

1. Identify the mega-scopic types of rock forming minerals and ore forming minerals
2. Describe the mega-scopic types of Igneous, Sedimentary and Metamorphic rocks
3. Interpret and draw sections of geological maps and calculate strike and dip for simple structural geology problems
4. Categorize the soil using Bore Hole Data with ISC classification system
5. Determine the strength of rocks using various laboratory tests.

Course Outcomes:

At the end of the Course/Subject, the students will be able to:

1. Identify physical properties of minerals
2. Recognize physical properties of rocks
3. Appraise the profile and calculate the creek gradient and steep slopes of given geological maps

4. Interpret the strike and dip problems for a given simple structural problems
5. Classify the soil by using bore hole data in ISC system.

List of Experiments as per Curriculum:

1) Physical Properties of minerals : Mega - scopic identification of

   i) Rock forming minerals --- Quartz Group, Feldspar Group, Garnet Group, Mica Group & Talc, Chlorite, Olivine, Kyanite, Asbestos, Tourmaline, Calcite, Gypsum, etc...

   ii) Ore Forming minerals --- Magnetite, Hematite, Pyrite, Pyrolusite, Graphite, Chromite, etc...

2) Mega - scopic description and identification of rocks

   i) Igneous Rocks -- Types of Granite, Pegmatite, Gabbro, Dolerite, Syenite, Granite, Porphyry, Basalt, etc..,

   ii) Sedimentary rocks -- Sand stone, Ferrugeneous sand stone, Lime stone, Shale, laterite, Conglamorate, etc...

   iii) Metamorphic Rocks -- Biotite - Granite Gneiss, Slate, Muscovite & Biotite schist, Marble, Khondalite, etc..,

3) Interpretation and drawing of sections for geological maps showing tilted beds, faults, unconformities etc.,

4) Simple structural Geology problems

5) Bore Hole Data

6) Strength of the rock using laboratory tests

7) Field work - To identify minerals, Rocks, Geomorphology & Structural Geology

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: B.Tech Faculty Name: B.Swetha Malika

Class	Semester	Title of The Subject	Subject Code	W.E.F
III	I	Transportation Engineering Lab	R1631018	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours		06	3	30	70	3

Programme Outcomes:

PO1: Engineering Knowledge: Apply knowledge of mathematics and science, with fundamentals of Computer Science & Engineering to be able to solve complex engineering problems related to CSE.

PO2: Problem Analysis: Identify, Formulate, review research literature and analyze complex engineering problems related to CSE and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3: Design/Development of solutions: Design solutions for complex engineering problems related to CSE and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.

PO4: Conduct Investigations of Complex problems: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to computer science related complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the CSE professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the CSE professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply Ethical Principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

1. Test crushing value, impact resistance, specific gravity, water absorption, percentage attrition, percentage abrasion, flakiness index, elongation index, and Angularity number for the given and aggregates.
2. Know penetration value, ductility value, softening point, flash and fire point, viscosity and stripping for the given bitumen grade.
3. Test the stability for the given bitumen mix.
4. Carry out surveys for traffic volume, speed and parking and design a rotary intersection.
5. Draw the cross-section of roads, carry Earth work calculations for road works.

Course Outcomes:

1. Test aggregates and judge the suitability of aggregates for the road construction.
2. Test the given bitumen samples and judge their suitability for the road construction.
3. Demonstrate the optimum bitumen content for the mix design
4. Determine the traffic volume, speed and parking characteristics and design rotary intersection.
5. Draw road cross-section, do Earth work calculations

List of Experiments as per Curriculum:

I.ROAD AGGREGATES:

1.Penetration test
2.Aggregate impact test
3.Specific gravity and water absorption test
4.Attrition test
5.Abrassion test
6.Stape test

II.BITUMINOUS MATERIALS:

1.penetration test
2.ductility test
3.softening test
4.flast and fire point test
5.stripping test
6.viscosity test

III.BITUMINOUS MIX:

1.Marshall stability test

IV:TRAFFIC SURVEYS:

1.Traffiv volume study at mid blocks

2. Traffic volume study at intersections

3.spot speed studies

4.parking studies

V:DESIGN &DRAWING:

1.Earth work calculations for road work

2.Drawing of road cross sections

3.Rotors intersection design

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: B.Tech Faculty Name: Syed.Imran

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	I	Environmental Engineering-II	RT41011	11/6/2018

SYLLABUS

<table>
<tr><td>Total No.of Hours for Teaching-Learning</td><td colspan="2">Instructional Hours for Week</td><td>Duration of semester End Examination in Hours</td><td colspan="2">Max Marks</td><td>Credits</td></tr>
<tr><td>60 Hours</td><td>Theory
4</td><td>Practical</td><td>3</td><td>Internal
30</td><td>External
70</td><td>3</td></tr>
</table>

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse

teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.

2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. List the appropriate appurtenances in the sewerage systems
2. Discuss the Pumping of wastewater and design of building drainage system
3. Examine the waste water characteristics &design the preliminary and primary treatment units
4. Describe the secondary treatment of Sewage
5. Identify the Miscellaneous treatments and design the septic and imhoff tanks
6. State the suitable methods for sludge disposal.

Course Objectives:

1. Get the knowledge of collection, conveyance and estimation of waste water and sewerage system and it's appurtenances
2. Get the knowledge of pumping and house plumbing systems of waste water and design of drainage
3. Learn the analysis of waste water and design the preliminary & primary treatment units
4. Understand secondary treatment methods of sewage
5. Get the idea about the miscellaneous treatment methods and working principles and design of septic and imhoff tanks
6. Handle the sludge and learn it's safe disposal

Syllabus:

UNIT – I: Introduction To Sanitation – systems of sanitation – relative merits & demerits – collection and conveyance of waste water – sewerage – classification of sewerage systems- Estimation of sewage flow and storm water drainage – fluctuations – types of sewers - Hydraulics of sewers and storm drains– design of sewers – appurtenances in sewerage – cleaning and ventilation of sewers.

UNIT – II: Pumping of wastewater: Pumping stations – location – components– types of pumps and their suitability with regard to wastewaters. House Plumbing: systems of plumbing-sanitary fittings and other accessories–one pipe and two pipe systems – Design of building drainage.

UNIT – III: Sewage characteristics – Sampling and analysis of wastewater - Physical, Chemical and Biological Examination-Measurement of BOD and COD - BOD equations. Treatment of sewage : Primary treatment-Screens-grit chambers-grease traps–floatation– sedimentation – design of preliminary and primary treatment units.

UNIT – IV: Secondary treatment: Aerobic and anaerobic treatment process-comparison. Suspended growth process: Activated Sludge Process, principles, designs, and operational problems, modifications of Activated Sludge Processes, Oxidation ponds, Aerated Lagoons. Attached Growth Process: Trickling Filters–mechanism of impurities removal- classification–design-operation and maintenance problems. RBCs, Fluidized bed reactors.

UNIT V: Miscellaneous Treatment Methods: Nitrification and Denitrification – Removal of Phosphates –UASB –Membrane reactors-Integrated fixed film reactors. Anaerobic Processes: Septic Tanks and Imhoff tanks- working Principles and Design–disposal of septic tank effluent.

UNIT – VI: Bio-solids (Sludge) management: Characteristics- handling and treatment of sludge-thickening – anaerobic digestion of sludge. Disposal of sewage: methods of disposal – disposal into water bodies, Oxygen Sag Curve-disposal on land-sewage sickness.

HOD CIVIL DEPT.
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College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: B. Tech in Civil Engineering **Faculty Name:** U.Krishna Sainath

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV Year	I Semester	Prestressed Concrete	RT41012	11/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical -	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.

2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

1. Learn the basic concepts of prestressing, materials (High strength concrete and High strength steel) and methods of prestressing.
2. Learn different systems and tensioning devices used in prestressing. Assumptions in analysis of prestress, Resultant stresses at a section, Pressure Line and Load Balancing concepts.
3. Learn the different losses of prestress
4. Familiarize with the types of flexural failure & design of flexural members, Factors influencing, prediction and control of deflections.
5. Familiarize with shear and principal stresses, Design for shear, torsion and combined bending, shear, torsion.
6. Familiarize with relevant IS Codal provisions for end zone & Anchorage Zone reinforcement.

Course Outcomes:

1. Compare & Contrast Reinforced Concrete and Prestressed Concrete.
2. List systems, tensioning devices of prestressing & Evaluate the stresses in tendons by pressure line and load balancing concept
3. Estimate the losses in prestress.
4. Design prestressed concrete beams for flexure.
5. Formulate & Design shear, torsion and combined bending, shear, torsion using code provisions.
6. Design & Draw End & Anchorage zone reinforcement.

Syllabus:

UNIT I

Basic concepts of Prestressing– Advantages and Applications of Prestressed Concretes, High Strength Concrete- Permissible Stresses, Shrinkage, Creep, Deformation Characteristics, High strength Steel- Types, Strength- Permissible Stresses- Relaxation of Stress, Stress Corrosion- Durability, Fire Resistance, Cover Requirements.

UNIT-II

Prestressing Systems– Introduction, Tensioning devices, Pre-tensioning Systems, Post tensioning Systems, Basic Assumptions in Analysis of prestress and design, Analysis of prestress, Resultant Stresses at a section-pressure line- Concepts of load balancing- Stresses in Tendons, Cracking moment.

UNIT-III

Losses of Pre-stressing– Loss of Pre-stress in pre-tensioned and post tensioned members due to various causes -Elastic shortening of concrete, shrinkage of concrete, creep of concrete, Relaxation of steel, slip in anchorage, differential shrinkage- bending of members and frictional losses- Total losses allowed for design.

UNIT-IV

Design for Flexural resistance– Types of flexural failure – Code procedures- Design of sections for flexure- Control of deflections- Factors influencing- Prediction of short term and long term deflections.

UNIT-V

Design for Shear and Torsion– Shear and Principal Stresses- Design of Shear reinforcements- Codal Provisions- Design for Torsion, Design for Combined bending, shear and torsion

UNIT-VI

Transfer of Prestress in pre tensioned members– Transmission length- Bond stresses- end zone reinforcement- Codal provisions- Anchorage zone Stresses in Post tensioned members- Stress distribution in end block- Anchorage Zone reinforcement.

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: B.Tech Faculty Name: T.Mutyala Raju

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	I	Construction Technology & Management	RT41013	11/6/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering

community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.

2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

1. Explore the knowledge, about the concepts of project management
2. Evaluate the knowledge of PERT, Crashing and allocation of resources.
3. Define skills on various equipment related to construction like earth moving Etc.
4. Explore knowledge on various earth work equipment such as hoists, Cranes, etc
5. Appraise on various concreting equipment such as crushers etc
6. Infer knowledge on various construction methods such as Piling, safety etc

Course Outcomes:

1. Value the importance of construction planning by using various network analysis techniques.
2. Evaluate PERT, cost analysis, crashing of optimum cost and resources.
3. Apply the functioning of various earth moving equipments by their types.
4. Classify the functioning of various earthwork equipments.
5. Examine methods of production of aggregate and concreting Equipment.

6. Apply the gained knowledge to construction techniques and safety.

Syllabus:

UNIT I

Construction Project management & its relevance, Qualities of a project Manager, Project Planning, Co-ordination &Scheduling, Monitoring, Bar Charts &Milestone Charts, Critical Path Method.

UNIT-II

Project Evaluation &Review Technique, Cost Analysis, Updating, Crashing for Optimum cost, Crashing for Optimum Resources, and Allocation of resources

UNIT-III

Construction Equipment, Economical Considerations, Earth Work Equipment, Trucks &Handling Equipment, Rear Dump Trucks, Capacities Of Trucks And Handling Equipment, Calculation Of Truck Production, Compaction Equipment, Types Of Compaction Rollers

UNIT-IV

Hoisting and earthwork equipment, hoists, cranes, tractors, bulldozers, graders, scrapers, clamshell buckets draglines

UNIT-V

Concreting Equipment, Crushers, Jaw Crushers, Gyratory Crushers, Impact Crushers, Selection Of Crushing

Equipment, Screening Of Aggregate, Concrete Mixers, Mixing And Placing Of Concrete, Consolidating And Finishing.

UNIT-VI

Construction Methods, Earthwork, Piling, Placing of Concrete, Form Work, Fabrication and Erection, Quality Control And Safety Engineering

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
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POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO
COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: B.Tech Faculty Name: K.Prudhvi

Class	Semester	Title of The Subject	Subject Code	W.E.F
IV	I	WRE-II	RT41014	11-6-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	06		3	30	70	3

Programme Outcomes:

PO1: Engineering Knowledge: Apply knowledge of mathematics and science, with fundamentals of Computer Science & Engineering to be able to solve complex engineering problems related to CSE.

PO2: Problem Analysis: Identify, Formulate, review research literature and analyze complex engineering problems related to CSE and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3: Design/Development of solutions: Design solutions for complex engineering problems related to CSE and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.

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PO5: Modern Tool Usage: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to computer science related complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the CSE professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the CSE professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

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PO9: Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

1. Know the types, Concepts in planning & design of Irrigation systems, Relationships between soil, water and plant ,Estimation of Duty and Delta and their significance in planning an irrigation system.
2. Learn the Design of Erodible Canals by using Kennedy's silt theory and Lacey's regime theory & Design of Non Erodible Canals , balancing depth of Cutting.
3. Study types and design principles of Canal structures like falls, canal regulators, cross drainage works, outlets.
4. Learn the types, components, failures of the diversion head works and design of impervious floor by using Bligh's Creep theory, Khosla's theory.
5. Learn about Reservoir planning, types of dams and analyze the stability of Gravity dam.
6. Know the types, stability of Earth dams and spillways and design principles of ogee spillways.

Course Outcomes:

1. Recognize water requirements and plan an Irrigation system
2. Design an Irrigation Canal and its network
3. Design an Irrigation Canal structure
4. Plan a diversion head works and Design impervious floor of diversion head works .
5. Select a suitable type of Dam and Appraise the stability of Gravity Dam
6. Examine the stability of earth dams, Design principles of Ogee spillways

Syllabus:

Unit-I: **IRRIGATION**

Necessity and importance of irrigation principal Crops and Crop seasons, types, methods of application soil-water-plant relationship, soil moisture Constants Consumptive use, estimation of Consumptive use Crop water requirement, duty and delta factors affecting duty, depth and frequency of irrigation, irrigation efficiencies Irrigation efficiencies Water logging and drainage, Standards of quality for irrigation water, Crop rotation.

Unit-II: **CANALS**

Classification of Canals Design of non-erodible Canals - methods of economic section and maximum permissible velocity Economics of Canal lining Design of erodible Canals -Kennedy's silt theory and Lacey's regime theory balancing depth of Cutting

Unit-III: CANAL STRUCTURES

Falls: Types and location, design principles of Sarda type fall and straight glacious fall **Regulators:** Head and Cross regulators, design principles **Cross Drainage Works:** Types, selection, design principles of aqueduct, siphon aqueduct and super passage. **Outlets**: Types, proportionality, **River Training:** Objectives and approaches sensitivity and flexibility

Unit-IV: DIVERSION HEAD WORKS

Types of diversion head works Layout of diversion head works, Components Causes and failures of weirs on permeable foundations Bligh's Creep theory, Khosla's theory Design of impervious floors for subsurface flow, exit gradient.

Unit-V: DAMS AND RESERVOIRS

Investigations, site selection, zones of storage and yield and storage Capacity of reservoir, reservoir sedimentation.
Dams: Types of dams, selection of type of dam, selection of site for a dam.
Gravity dams: Forces acting on a gravity dam**,** Causes of failure of gravity dam Elementary profile and practical profile of a gravity dam, limiting height of a dam Stability analysis, drainage galleries, grouting.

Unit-VI:

Earth Dams: Types, Causes of failure, Criteria for safe design, sudden drawdown Conditions.
Seepage, measures for Control of seepage. Stability analysis-stability of downstream slope during steady seepage and upstream slope during sudden drawdown Conditions.
Spillways: Types, design principles of ogee spillways, Types of spillways Crest gates. Energy dissipation below of spillways-stilling basin and its appurtenances.

HOD CIVIL DEPT.
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COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: CIVIL   Faculty Name: M Sudhakar

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV CIVIL	I	Remote Sensing & GIS	RT41015	11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	6	----	3 Hours	30	70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Define the physical principles of remote sensing(scattering, reflection, and absorption of electromagnetic radiation) and Digital image formats (line, pixel, sequential)
2. Recognize the visual interpretation processing, enhancement and classification.
3. Describe the concepts ,& components of GIS and different types of data representation models.
4. Recognize the Spatial data operators, Network for optimal path & Tracing .
5. Apply RS & GIS tool in the areas of agriculture, forestry, geology, geomorphology and urban land area
6. Apply RS & GIS tool in fields of Water Resources Engineering and Watershed Management.

Course Objectives:

1. Learn the concepts of Remote Sensing, Types of sensors & platforms and digital image formats.
2. Learn various elements of Visual interpretations & Image classification.
3. Understand the concepts of GIS, its components and various data representation models.
4. Learn Spatial data analysis using Overlay operators & decision table; Network analysis & Tracing.
5. Understand the applications of RS & GIS in agriculture, forestry, geology, geomorphology and urban land area applications.
6. Understand the applications of RS & GIS in Hydrology and water resources.

SYLLABUS:

UNIT – I Introduction to remote sensing: Basic concepts of remote sensing, electromagnetic radiation, electromagnetic spectrum, interaction with atmosphere, energy interaction with the earth surfaces, Characteristics of remote sensing systems

Sensors and platforms: Introduction, types of sensors, airborne remote sensing, spaceborne remote sensing, image data characteristics, digital image data formats-band interleaved by pixel, band interleaved by line, band sequential, IRS, LANDSAT, SPOT, MODIS, ASTER,RISAT and CARTOSAT

UNIT – II Image analysis: Introduction, elements of visual interpretations, digital image processing-image preprocessing, image enhancement, image classification, supervised classification, unsupervised classification.

UNIT – III Geographic Information System: Introduction, key components, application areas of GIS, map projections.

Data entry and preparation: spatial data input, raster data models, vector data mode

UNIT – IV Spatial data analysis: Introduction, overlay function-vector overlay operations, raster overlay operations, arithmetic operators, comparison and logical operators, conditional expressions, overlay using a decision table, network analysis-optimal path finding, network allocation, network tracing and buffer analysis.

UNIT – V RS and GIS applications
General: Land cover and land use, agriculture, forestry, geology, geomorphology, urban applications,

UNIT – VI Applications of Hydrology
Water Resources and Disaster Management: Flood zoning and mapping, groundwater prospects and potential recharge zones, watershed management and disaster management with case studies.

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: B.Tech Faculty Name: P.Vinay

Class	Semester	Title of The Subject	Subject Code	W.E.F
IV	I	APC	RT41017	11-6-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	06		3	30	70	3

Programme Outcomes:

PO1: Engineering Knowledge: Apply knowledge of mathematics and science, with fundamentals of Computer Science & Engineering to be able to solve complex engineering problems related to CSE.

PO2: Problem Analysis: Identify, Formulate, review research literature and analyze complex engineering problems related to CSE and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3: Design/Development of solutions: Design solutions for complex engineering problems related to CSE and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.

PO4: Conduct Investigations of Complex problems: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to computer science related complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the CSE professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the CSE professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply Ethical Principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.

2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

1. Understand basic aspects on air pollution and its impact
2. Examine and clearly understand Kinetics of air pollution.
3. Clearly understand interpret and explain the properties of atmosphere. And plume behaviour.
4. Understand the pollutant concentration and compare to limit values
5. Describe the operation and control of particulates by equipment.
6. Identify the control methods for the control of flue gases

Syllabus:

UNIT-I: AIR POLLUTION: Sampling and analysis of air pollutants, conversion of ppm into ug/m^3. Defintion of terms related to air pollution and control secondary pollutants- Indoor air pollution- Climate change and its impact Carbon Trade.

UNIT-II: Thermodynamics and Kinetics of Air pollution: Applications in the removal of gases like Sox, NOx, CO and HC – Air fuel ratio, Computation and control of products of combustion, Automobile pollution. Odour pollution control, Flares.

UNIT-III: Metrology and Air Pollution: Properties of atmosphere: Heat, pressure, wind forces, Moisture and relative humidity, Lapse rates- influence of terrain and meteorological phenomena on plume behavior and air quality- Wind rose diagrams, plume rise models.

UNIT-IV: Ambient air quality management: monitoring of SPM, SO2: NOx and CO – stack Monitoring for flue gases- micro meteorological monitoring weather station. Estimation standards- Gaussian model for Plume dispersion.

UNIT-V: Air pollution control: control of particulates- control at sources, process changes, equipment modifications, design and operation of control equipments- settling chambers, cyclone separators-fabric filter scrubbers, electrostatic precipitators.

UNIT-VI : Air pollution control methods: control of NOx and Sox emissions- environmental friendly fuels- in plant control measures, process changes, methods of removal and recycling environmental criteria for setting and industries and green belts.

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: CIVIL Faculty Name: Syed Imran

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV CIVIL	I	Environmental Engineering Lab	RT4101L	11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
40 Hours	Theory -	Practical 3	3 Hours	Internal 25	External 50	2

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Evaluate water quality based on chemical analysis of given samples

2. Appraise water quality based on physical analysis of given samples

Course Objectives:

1. Learn the laboratory practices to estimate the chemical properties like pH, alkalinity, acidity, hardness, chlorides, total, suspended and dissolved solids, D.O., B.O.D., COD and residual chlorine present in the water and waste water samples

2. Learn the laboratory practices to estimate the physical properties like turbidity in the water and waste water samples.

SYLLABUS:

List of Experiments

1. Determination of pH and Electrical Conductivity (Salinity) of Water and Soil.
2. Determination and estimation of Total Hardness–Calcium & Magnesium.
3. Determination of Alkalinity/Acidity
4. Determination of Chlorides in water and soil
5. Determination and Estimation of total solids, organic solids and inorganic solids and settleable solids by Imhoff Cone.
6. Determination of Iron.
7. Determination of Dissolved Oxygen with D.O. Meter & Wrinklers Method and B.O.D.
8. Physical parameters – Temperature, Colour, Odour, Turbidity, Taste.
9. Determination of C.O.D.
10. Determination of Optimum coagulant dose..

HOD CIVIL DEPT.
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POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY

VIJAYAWADA - 520 001.

Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: CIVIL Faculty Name: M.Sudhakar

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV CIVIL	I	GIS & CAD LAB	RT4101M	11/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
40 Hours	Theory -	Practical 3	3 Hours	Internal 25	External 50	2

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Analyze & Design the concrete beams, frames & Special Structures using structural analysis software.
2. Analyze & Design the steel structures using structural analysis software.
3. Digitize and create thematic map and Apply GIS software various engineering fields.
4. Estimate the different features & obtain model elevation from maps.

Course Objectives:

1. Learn to analyze & design of frames, steel tubular truss, Retaining wall & Simple Tower using structural analysis software.
2. Understand the creation of maps and apply GIS software in various engineering fields.

SYLLABUS:

GIS:

SOFTWARES:

1. Arc GIS 9.0
2. ERDAS 8.7
3. Mapinfo 6.5

Any one or Equivalent.

EXCERCISES IN GIS:

1. Digitization of Map/Top sheet
2. Creation of thematic maps.
3. Estimation of features and interpretation
4. Developing digital Elevation Model
5. Simple applications of GIS in water Resources Engineering & Transportation Engineering.

COMPUTER AIDED DESIGN AND DRAWING:

SOFTWARE:

- STAAD PRO / Equivalent/
- STRAAP
- STUDDS

EXCERCISIES:

1. 2-D Frame Analysis and Design
2. Steel Tabular Truss Analysis and Design
3. 3-D Frame Analysis and Design
4. Retaining Wall Analysis and Design
5. Simple Tower Analysis and Design

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: B.Tech in Civil Engineering Faculty Name: T.S.V.DURGA

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	1I	Building planning & Drawing	R1622011	19-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem** research literature, and analyze complex engineering problems reaching substantiated **analysis** Identify, formulate, conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues

2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1.Explain the objectives of building byelaws and regulations.

2.Illustrate the different rooms and recognize their grouping in Residential building.

3.Paraphrase the Planning & importance of Public Buildings.

4.Sketch the different Sign Conventions & Bonds used in Planning of buildings.

5. Sketch the different types & detailing of Doors, Windows, Ventilators and Roofs.

6. Sketch the Plan, Elevation and sections of a Residential & Public buildings from the given line diagram.

Course Objectives:

1. Recognize the importance of Building Byelaws & Regulations.

2. List the minimum standards of building elements & their grouping.

3. Discuss the Planning of Public Buildings.

4. Identify the Sign Conventions & Bonds used in Drawing.

5. Explain the different types & detailing of Doors, Windows, Ventilators and Roofs

6. Create with Planning and Drawing of Residential & Public Buildings- Plan, Elevation and sections.

UNIT I:
BUILDING BYELAWS AND REGULATIONS
Introduction- terminology- objectives of building byelaws- floor area ratio floor space index- principles under laying building bye laws- classification of buildings- open space requirements – built up area limitations- height of buildings- wall thickness – lightening and ventilation requirements.

UNIT II:
RESIDENTIAL BUILDINGS
Minimum standards for various parts of buildings- requirements of different rooms and their grouping- characteristics of various types residential buildings.

UNIT III:
PUBLIC BUILDINGS
Planning of educational institutions, hospitals, dispensaries, office buildings, banks, industrial buildings, hotels & motels, buildings for recreation.

UNIT IV :
SIGN CONVENTIONS AND BONDS
Brick, stone, plaster, sand filling, concrete, glass, steel, cast iron, copper alloys, aluminium alloys etc., lead, zinc, tin etc., earth, rock, timber and marbles. English bond and Flemish bond- odd and even courses for one, one-half, two and two & half brick walls in thickness at the junction of a corner.

UNIT V:
DOORS, WINDOWS, VENTILATORS AND ROOFS
Panelled door, panelled and glassed door, glassed windows, panelled windows, swing ventilators, fixed ventilators, coupled roof, collar roofs. King Post truss, Queen Post truss Sloped and flat roof buildings: drawing plans, Elevations and Cross Sections of given sloped roof buildings

UNIT VI:
PLANNING AND DESIGNING OF BUILDINGS
Draw the Plan, Elevation and sections of a Residential & Public buildings from the given line diagram.

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Program Name: B.TECH Faculty Name: S.SNIGDHA

Class	Semester	Title of The Paper	Paper Code	W.E.F
II	II	CONCRETE TECHNOLOGY	RT22014	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
85 Hours	5	-	3	30	70	3

PROGRAMME OUTCOMES:

PO1: Engineering Knowledge: Apply knowledge of mathematics and science, with fundamentals of Computer Science & Engineering to be able to solve complex engineering problems related to CSE.

PO2: Problem Analysis: Identify, Formulate, review research literature and analyze complex engineering problems related to CSE and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3: Design/Development of solutions: Design solutions for complex engineering problems related to CSE and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.

PO4: Conduct Investigations of Complex problems: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to computer science related complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the CSE professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the CSE professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply Ethical Principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

COURSE OUTCOMES:

1. Assess the ingredients of concrete & admixtures

2. Test the fresh concrete properties

3. Test the properties of hardened concrete

4. Evaluate with various Mechanical properties of concrete

5. Design concrete mix by various methods of mix design

6. Recognize special concrete properties and their applications.

COURSE OBJECTIVES:

1. Explore the ingredients of concrete & admixtures
2. Experiment properties of concrete in fresh state.
3. Examine properties of concrete in hardened state.
4. Familiarize rheological properties of concrete.
5. Design concrete mix using different codes.
6. Contrast special concrete & their applications

SYLLABUS:

UNIT I : Ingredients Of Concrete Cements & Admixtures: Portland cement – Chemical composition – Hydration, Setting of cement, Fineness of cement, Structure of hydrate cement – Test for physical properties – Different grades of cements – Admixtures – Mineral and chemical admixtures – accelerators, retarders, air entrainers, plasticizers, super plasticizers, fly ash and silica fume.

Aggregates: Classification of aggregate – Particle shape & texture – Bond, strength & other mechanical properties of aggregates – Specific gravity, Bulk density, porosity, adsorption & moisture content of aggregate – Bulking of sand –Deleterious substance in aggregate – Soundness of aggregate – Alkali aggregate reaction – Thermal properties – Sieve analysis –

Fineness modulus – Grading curves – Grading of fine & coarse Aggregates – Gap graded and well graded aggregate as per relevant IS code – Maximum aggregate size. Quality of mixing water.

UNIT – II, Fresh Concrete: Steps in Manufacture of Concrete–proportion, mixing, placing, compaction, finishing, curing – including various types in each stage. Properties of fresh concrete-Workability – Factors affecting workability – Measurement of workability by different tests, Setting times of concrete, Effect of time and temperature on workability – Segregation & bleeding – Mixing and vibration of concrete, Ready mixed concrete, Shotcrete

UNIT – III, Hardened Concrete: Water / Cement ratio – Abram's Law – Gel space ratio – Nature of strength of concrete –Maturity concept – Strength in tension & compression – Factors affecting strength – Relation between compression & tensile strength – Curing, Testing of Hardened Concrete: Compression tests – Tension tests – Factors affecting strength – Flexure tests –Splitting tests – Non-destructive testing methods – codal provisions for NDT.

UNIT – IV, Elasticity, Creep & Shrinkage, Modulus of elasticity, Dynamic modulus of elasticity , Poisson's ratio, Creep of concrete, Factors influencing creep, Relation between creep & time, Nature of creep, Effects of creep – Shrinkage –types of shrinkage.

UNIT – V, Mix Design: Factors in the choice of mix proportions – Durability of concrete – Quality Control of concrete – Statistical methods – Acceptance criteria – Concepts Proportioning of concrete mixes by various methods – BIS method of mix design.

UNIT – VI, Special Concretes: Ready mixed concrete, Shotcrete, Light weight aggregate concrete, Cellular concrete, No-fines concrete, High density concrete, Fibre reinforced concrete, Different types of fibres, Factors affecting properties of F.R.C, Polymer concrete, Types of Polymer concrete, Properties of polymer concrete, High performance concrete – Self consolidating concrete, SIFCON, self healing concrete.

Program Name: B.Tech Faculty Name: K.Prudhvi

Class	Semester	Title of The Subject	Subject Code	W.E.F
II	II	H&HM	R1622013	19-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	06		3	30	70	3

Programme Outcomes:

PO1: Engineering Knowledge: Apply knowledge of mathematics and science, with fundamentals of Computer Science & Engineering to be able to solve complex engineering problems related to CSE.

PO2: Problem Analysis: Identify, Formulate, review research literature and analyze complex engineering problems related to CSE and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3: Design/Development of solutions: Design solutions for complex engineering problems related to CSE and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.

PO4: Conduct Investigations of Complex problems: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to computer science related complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the CSE professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the CSE professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply Ethical Principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

To study about uniform and non uniform flows in open channel and also to learn about the characteristics of hydraulic jump
• To introduce dimensional analysis for fluid flow problems
• To understand the working principles of various types of hydraulic machines and Pumps.

Course Outcomes:

Solve uniform and non uniform open channel flow problems.
• Apply the principals of dimensional analysis and similitude in hydraulic model testing.
• Understand the working principles of various hydraulic machineries and pumps.

Syllabus Unit Wise:

UNIT – I UNIFORM FLOW IN OPEN CHANNELS:
Types of channels –Types of flows - Velocity distribution – Energy and momentum correction factors – Chezy's, and Manning's formulae for uniform flow – Most Economical sections, Critical flow: Specific energy-critical depth – computation of critical depth

UNIT II NON-UNIFORM FLOW IN OPEN CHANNELS: Steady Gradually Varied flow-Dynamic equation, Mild, Critical, Steep, horizontal and adverse slopes-surface profilesdirect step method- Rapidly varied flow, hydraulic jump, energy dissipation.

UNIT – III HYDRAULIC SIMILITUDE: Dimensional analysis-Rayleigh's method and Buckingham's pi theorem-study of Hydraulic models – Geometric, kinematic and dynamic similarities-dimensionless numbers – model and prototype relations.

UNIT – IV BASICS OF TURBO MACHINERY: Hydrodynamic force of jets on stationary and moving flat , inclined and curved vanes, jet striking centrally and at tip, velocity triangles at inlet and outlet, expressions for work done and efficiency-Angular momentum principle

UNIT – V HYDRAULIC TURBINES – I: Layout of a typical Hydropower installation – Heads and efficiencies - classification of turbines. Pelton wheel - Francis turbine - Kaplan turbine - working, working proportions, velocity diagram, work done and efficiency, hydraulic design, draft tube – theory and efficiency. Governing of turbines-surge tanks-unit and specific quantities, selection of turbines, performance characteristics-geometric similarity-cavitation.

UNIT – VI CENTRAIFUGAL-PUMPS: Pump installation details-classification-work done- Manometric head-minimum starting speed-losses and efficiencies-specific speed, multistage pumps-pumps in parallel and series - performance of pumps-characteristic curves-NPSH- Cavitation.

RECIPROCATING PUMPS: Introduction, classification, components, working, discharge, indicator diagram, work done and slip.

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
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POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO
COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
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Program Name: CIVIL Faculty Name:S.Naga Bhargavi

Class	Semester	Title of The Paper	Paper Code	W.E.F
II CIVIL	II	Structural Analysis-I	R1622015	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 6	Practical ----	3 Hours	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Evaluate Shear force, bending moment and deflections of propped cantilever beams subjected to various types of loadings.
2. Evaluate Shear force, bending moment and deflections of Fixed beams subjected to various types of loadings.
3. Appraise Shear force and bending moment of Continuous beams subjected to various types of loadings.
4. Formulate and Solve Slope deflection equation for continuous beams.
5. Apply strain energy expressions in linear elastic systems and Estimate deflections of beams and trusses.
6. Examine loads in Pratt and Warren trusses when loads of different types and spans were passing over the truss.

Course Objectives:

1. Familiarize concepts of bending moment, shear force and deflection under various loading conditions in propped cantilever beams.
2. Learn about bending moment, shear force and deflection under various loading conditions in Fixed beams.
3. Study the concepts of bending moment and shear force under various loading conditions in Continuous beams.
4. Learn slope deflection equations & to apply for continuous beams.
5. Study about the strain energy due to axial load, bending moment and shear force in linear elastic systems & to estimate deflections of simple beams and pin jointed trusses.
6. Learn the concepts of moving loads and influence lines for assessment of maximum SF and BM at a given section when loads of varying spans are passing over beams of different spans of Pratt and Warren trusses.

Syllabus:

UNIT – I Propped Cantilevers: Analysis of propped cantilevers-shear force and Bending moment diagrams-Deflection of propped cantilevers.

UNIT – II Fixed Beams – Introduction to statically indeterminate beams with U. D. load, central point load, eccentric point load, number of point loads, uniformly varying load, couple and combination of loads - shear force and Bending moment diagrams-Deflection of fixed beams including effect of sinking of support, effect of rotation of a support.

UNIT – III Continuous Beams: Introduction-Clapeyron's theorem of three moments-Analysis of continuous beams with constant moment of inertia with one or both ends fixed-continuous beams with overhang, continuous beams with different moment of inertia for different spans-Effects of sinking of supports-shear force and Bending moment diagrams.

UNIT-IV Slope-Deflection Method: Introduction, derivation of slope deflection equation, application to continuous beams with and without settlement of supports.

UNIT – V Energy Theorems: Introduction-Strain energy in linear elastic system, expression of strain energy due to axial load, bending moment and shear forces - Castigliano's first theorem-Deflections of simple beams and pin jointed trusses.

UNIT – VI Moving Loads And Influence Lines: Introduction maximum SF and BM at a given section and absolute maximum S.F. and B.M due to single concentrated load, U. D load longer than the span, U. D load shorter than the span, two point loads with fixed distance between them and several point loads-Equivalent uniformly distributed load-Focal length.

INFLUENCE LINES: Definition of influence line for SF, Influence line for BM- load position for maximum SF at a section-Load position for maximum BM at a sections, single point load, U.D. load longer than the span, U.D. load shorter than the span- Influence lines for forces in members of Pratt and Warren trusses.

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: B. Tech in Civil Engineering **Faculty Name:**U.Krishna Sainath

Class	Semester	Title of The Paper	Paper Code	W.E.F
II Year	II Semester	Surveying Field Work-II	R1622018	6

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
48 Hours	Theory -	Practical 3	2	Internal 25	External 50	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.

2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

The student will:

1. Illustrate with the measurement of angles & distances using Theodolite.
2. Memorize the design of Simple curves using linear methods.
3. Explain the concept of contouring using level
4. Define the functioning of Total Station

Course Outcomes:

At the end of the Course/Subject, the students will be able to:

1. Experiment the method of Theodolite survey to calculate Distances & Areas.
2. Design & setting out of Curve by linear methods.
3. Sketch the Contour plan of an area using level
4. Experiment of angles, heights & distances using Total station.

Course Syllabus:

1. Theodolite Survey: Determining the Horizontal and Vertical Angles by the method of repetition method.
2. Theodolite Survey: Finding the distance between two inaccessible points.
3. Theodolite Survey: Finding the height of far object.
4. Tacheomatric survey: Heights and distance problems using tacheomatric principles.
5. One Exercise on Curve setting.
6. One Exercise on contours.
7. Total Station : Introduction to total station and practicing setting up, levelling up and elimination of parallax error.
8. Total Station : Determination of area using total station.
9. Total Station : Traversing
10. Total Station : Contouring
11. Total Station : Determination of Remote height.
12. Total Station : distance between two inaccessible points.

HOD CIVIL DEPT.
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COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
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Program Name: CIVIL Faculty Name: M Sudhakar

Class	Semester	Title of The Paper	Paper Code	W.E.F
II CIVIL	II	Strength of Materials- II	R1622012	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	6	----	3 Hours	30	70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Appraise Principal stresses & Strains analytically, Graphically .
2. Evaluate Shear stress, Torque & Power of circular shafts by using Torsional equation & Deflections of various types of Springs.
3. Examine the Crippling & Safe loads using Euler's & Rankine's theories for the columns with different end conditions & Maximum deflection, Stress & Moment for the struts.
4. Synthesize thestresses for the column under eccentric loads, Dams, Chimneys & Retaining walls & check the stability of structures.
5. Examine Moments of inertia, Stresses &Deflection of beams subjected tounsymmetrical bending
6. Appraise the Forces in members of plane, pin-jointed, perfect trusses by method of Joints& method of Sections

Course Objectives:

1. Enable preliminary concepts of Principal stresses and strainsanalytically as well asgraphically due to stresses acting on the cross section and onany inclined plane. Concepts of failures in the material by different theories.
2. DeriveTorsion equation, andthere by calculate the power transmitted by shafts anddesign the cross section when subjected to loading using differenttheories of failures& deflections of Springs
3. Classify columns and calculation of load carrying capacity usingdifferent empirical formulae and to assess stresses due to axial andlateral loads for different edge conditions
4. Determination of stresses under the combined action of direct loading and Bending Moment.
5. Introduce the concept of unsymmetrical bending in beams Locationof neutral axis Deflection of beams under unsymmetrical bending.
6. Determination of Forces in members of trusses by method of joints& method of sections.

SYLLABUS:

UNIT- I Principal Stresses And Strains And Theories Of Failures: Introduction – Stresses on an inclined section of a bar under axial loading – compound stresses – Normal and tangential stresses on an inclined plane for biaxial stresses – Two perpendicular normal stresses accompanied by a state of simple shear – Mohr’s circle of stresses – Principal stresses and strains – Analytical and graphical solutions.
Theories Of Failures: Introduction – Various Theories of failures like Maximum Principal stress theory – Maximum Principal strain theory – Maximum shear stress theory – Maximum strain energy theory – Maximum shear strain energy theory.

UNIT – II Torsion Of Circular Shafts And Springs: Theory of pure torsion – Derivation of Torsion equations: $T/J = q/r = N\phi/L$ – Assumptions made in the theory of pure torsion – Torsional moment of resistance – Polar section modulus – Power transmitted by shafts – Combined bending and torsion and end thrust – Design of shafts according to theories of failure.

Springs: Introduction – Types of springs – deflection of close and open coiled helical springs under axial pull and axial couple – springs in series and parallel – Carriage or leaf springs.

UNIT – III Columns And Struts: Introduction – Types of columns – Short, medium and long columns – Axially loaded compression members – Crushing load – Euler's theorem for long columns- assumptions- derivation of Euler's critical load formulae for various end conditions – Equivalent length of a column – slenderness ratio – Euler's critical stress – Limitations of Euler's theory – Rankine – Gordon formula – Long columns subjected to eccentric loading – Secant formula – Empirical formulae – Straight line formula – Prof. Perry's formula.
Laterally loaded struts – subjected to uniformly distributed and concentrated loads – Maximum B.M. and stress due to transverse and lateral loading.

UNIT – IV Direct And Bending Stresses: Stresses under the combined action of direct loading and B.M. Core of a section – determination of stresses in the case of chimneys, retaining walls and dams – conditions for stability – stresses due to direct loading and B.M. about both axis.

UNIT – V Unsymetrical Bending: Introduction – Centroidal principal axes of section – Graphical method for locating principal axes – Moments of inertia referred to any set of rectangular axes – Stresses in beams subjected to unsymmetrical bending – Principal axes – Resolution of bending moment into two rectangular axes through the centroid – Location of neutral axis Deflection of beams under unsymmetrical bending.

UNIT – VI Analysis Of Pin-Jointed Plane Frames: Determination of Forces in members of plane pin-jointed perfect trusses by (i) method of joints and (ii) method of sections. Analysis of various types of cantilever and simply supported trusses by method of joints, method of sections.

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HOD CIVIL DEPT.
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VIJAYAWADA - 520 001.
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Program Name: B.Tech Faculty Name: B.Swetha Malika

Class	Semester	Title of The Subject	Subject Code	W.E.F
II	II	Transportation Engineering -I	R1622016	19-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	06		3	30	70	3

Programme Outcomes:

PO1: Engineering Knowledge: Apply knowledge of mathematics and science, with fundamentals of Computer Science & Engineering to be able to solve complex engineering problems related to CSE.

PO2: Problem Analysis: Identify, Formulate, review research literature and analyze complex engineering problems related to CSE and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3: Design/Development of solutions: Design solutions for complex engineering problems related to CSE and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.

PO4: Conduct Investigations of Complex problems: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to computer science related complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the CSE professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the CSE professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply Ethical Principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

1. Learn Basic knowledge on various highway developmental engineering surveys, drawings, reports and highway networks.
2. Study the design geometry of highways
3. Learn concepts of conducting traffic surveys and design of intersections & signals
4. Learn various tests conducted on Highway materials like bitumen, aggregates
5. Study the design principles of Highway pavements
6. Learn the construction procedure and maintenance of highways

Course Outcomes:

1. Plan the highway network for a given area based on engineering surveys
2. Design highway geometrics
3. Develop the intersections and signals in required area based on traffic surveys
4. Judge suitability of pavement materials for the construction of roads.
5. Design flexible and rigid pavements
6. Construct & maintain the highways

Course Syllabus Unit Wise:

UNIT - I Highway Planning and Alignment:
Highway development in India; Classification of Roads; Road Network Patterns; Necessity for Highway Planning; Different Road Development Plans – First, second, third road development plans, road development vision 2021, Rural Road Development Plan – Vision 2025; Planning Surveys; Highway Alignment- Factors affecting Alignment- Engineering Surveys – Drawings and Reports.

UNIT – II Highway Geometric Design:
Importance of Geometric Design- Design controls and Criteria- Highway Cross Section Elements- Sight Distance Elements-Stopping sight Distance, Overtaking Sight Distance and Intermediate Sight Distance- Design of Horizontal Alignment-Design of Super elevation and Extra widening-Design of Transition Curves-Design of Vertical alignment-Gradients- Vertical curves.

UNIT – III Traffic Engineering:
Basic Parameters of Traffic-Volume, Speed and Density-Traffic Volume Studies; Speed studies – spot speed and speed & delay studies; Parking Studies; Road Accidents-Causes and Preventive

measures - Condition Diagram and Collision Diagrams; PCU Factors, Capacity of Highways – Factors Affecting; LOS Concepts; Road Traffic Signs; Road markings; Types of Intersections; At-Grade Intersections – Design of Plain, Flared, Rotary and Channelized Intersections; Design of Traffic Signals –Webster Method –IRC Method.

UNIT – IV, Highway Materials:

Subgrade soil: classification –Group Index – Subgrade soil strength – California Bearing Ratio – Modulus of Subgrade Reaction. Stone aggregates: Desirable properties – Tests for Road Aggregates – Bituminous Materials: Types – Desirable properties – Tests on Bitumen – Bituminous paving mixes: Requirements – Marshall Method of Mix Design.

UNIT – V, Design of Pavements:

Types of pavements; Functions and requirements of different components of pavements; Design Factors

***Flexible Pavements**:* Design factors – Flexible Pavement Design Methods – CBR method – IRC method – Burmister method – Mechanistic method – IRC Method for Low volume Flexible pavements.

Rigid Pavements: Design Considerations – wheel load stresses – Temperature stresses – Frictional stresses – Combination of stresses – Design of slabs – Design of Joints – IRC method – Rigid pavements for low volume roads – Continuously Reinforced Cement Concrete Pavements – Roller Compacted Concrete Pavements.

UNIT – VI Highway Construction and Maintenance:

Types of Highway Construction – Earthwork; Construction of Earth Roads, Gravel Roads, Water Bound Macadam Roads, Bituminous Pavements and Construction of Cement Concrete Pavements. Pavement Failures, Maintenance of Highways, pavement evaluation, strengthening of existing pavements

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: CIVIL Faculty Name:S.Naga Bhargavi

Class	Semester	Title of The Paper	Paper Code	W.E.F
II CIVIL	II	FM & HM LAB	R1622017	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
40 Hours	Theory 0	Practical 3	3 Hours	Internal 25	External 50	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
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12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Determine the various coefficients for disparate equipments
2. Determine efficiencies of various turbines & pumps
3. Derive Hydraulic jump& Verify of Bernoulli's Equation

Course Objectives:

1. Familiarize the procedure of finding various coefficients by using disparate equipments
2. Familiarize the procedure of finding efficiencies of various turbines & pumps
3. Study of Hydraulic jump& Verification of Bernoulli's Equation

SYLLABUS:

List of Experiments

1. Calibration of Venturimeter & Orifice meter
2. Determination of Coefficient of discharge for a small orifice by a constant head method.
3. Determination of Coefficient of discharge for an external mouth piece by variable head method.
4. Calibration of contracted Rectangular Notch and /or Triangular Notch
5. Determination of Coefficient of loss of head in a sudden contraction and friction factor.
6. Verification of Bernoulli's equation.
7. Impact of jet on vanes
8. Study of Hydraulic jump.
9. Performance test on Pelton wheel turbine
10. Performance test on Francis turbine.
11. Efficiency test on centrifugal pump.
12. Efficiency test on reciprocating pump.

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: CIVIL Faculty Name: K.V.Lakshmi Narayana

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV CIVIL	I	Geotechnical engineering -I		19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 6	Practical ----	3 Hours	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Describe the concepts of types of soils, soil structures ,clay mineralogy for establishing inter-relationships between mass, volume and density
2. Appraise various index properties of the soils and classification of soils.
3. Identify the importance of permeability, seepage and effective stress concept
4. Evaluate the stress distribution in soil for various shapes of loading
5. Recognize the importance of the engineering property of the soil consolidation and determining them in laboratory
6. Analyse the shear parameters of soil and its importance to find out the shear strength of a soil.

Course Objectives:

1. Gain the basic knowledge of various structures of soil and the clay mineralogy and grain size analysis
2. Determine the index properties of the soil and classification.
3. Understand the concept of seepage of water through soils and determining the discharge of water through soils.
4. Learn the concept of stress distribution in soils, determining the stress intensity for various shapes of loads at different levels.
5. Know the principles of compaction and consolidation of soils , determining the magnitude and the rate of consolidation settlement
6. Understand the concept of shear strength of soils, determining the shear parameters of sands and clays

SYLLABUS:

UNIT – I Introduction: Soil formation – soil structure and clay mineralogy – Adsorbed water – Mass- volume relationship –Relative density , Mechanism of compaction – factors affecting – effects of compaction on soil properties - compaction control.

UNIT – II Index Properties Of Soils: Grain size analysis – Sieve and Hydrometer methods

– consistency limits and indices – Various Types of soil Classifications – Unified soil classification and I.S. Soil classification.

UNIT –III Permeability: Soil water – capillary rise – One dimensioned flow of water through soils – Darcy's law- permeability – Factors affecting –laboratory determination of coefficient of permeability –Permeability of layered systems. Total, neutral and effective stresses –quick sand condition – 2-D flow and Laplace's equation - Seepage through soils – Flow nets: Characteristics and Uses.

UNIT – IV Stress Distribution In Soils: Stresses induced by applied loads - Boussinesq's and Westergaard's theories for point loads and areas of different shapes– Newmark's influence chart – 2:1 stress distribution method.

UNIT – V Consolidation: Compressibility of soils – e-p and e-log p curves – Stress history – Concept of consolidation - Spring Analogy - Terzaghi's theory of one-dimensional Consolidation – Time rate of consolidation and degree of consolidation – Determination of coefficient of consolidation (c_v) - Over consolidated and normally consolidated clays.

UNIT – VI Shear Strength of Soils: Basic mechanism of shear strength - Mohr – Coulomb Failure theories – Stress-Strain behavior of Sands - Critical Void Ratio – Stress-Strain behavior of clays – Shear Strength determination- various drainage conditions.

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COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
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Program Name: CIVIL   Faculty Name:S.Naga Bhargavi

Class	Semester	Title of The Paper	Paper Code	W.E.F
III CIVIL	II	Design & Drawing of Steel Structures		19/11/2018

SYLLABUS

<table>
<tr><td>Total No.of Hours for Teaching-Learning</td><td colspan="2">Instructional Hours for Week</td><td>Duration of semester End Examination in Hours</td><td colspan="2">Max Marks</td><td>Credits</td></tr>
<tr><td>60 Hours</td><td>Theory
6</td><td>Practical
----</td><td>3 Hours</td><td>Internal
30</td><td>External
70</td><td>3</td></tr>
</table>

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Define the basic elements of a steel structure and fundamentals of structural steel fasteners.
2. Design basic elements of steel structures (beams)
3. Design tension members, compression members and Roof trusses.
4. Design columns both laced and battened.
5. Design column bases. (Both gusset and slab bases)
6. Design Plate girder and gantry girder.

Course Objectives:

1. To introduce steel structures and its basic components, and introduce structural steel fasteners like welding and reviting.
2. To design beams (laterally supported, unsupported and build up sections)
3. To design tension members, compression members and roof trusses
4. To design beam-columns both laced and battened
5. To familiarize students with column bases and their design.
6. To familiarize students with Plate girder and Gantry Girder and their Design.

SYLLABUS:

UNIT – I Connections: Introduction: (a) Riveted connections – Definition, rivet strength and capacity- Codal Provisions, (**b) Welded connections**: Introduction, Advantages and disadvantages of welding- Strength of welds-Butt and fillet welds: Permissible stresses – IS Code requirements. Design of fillet weld subjected to moment acting in the plane and at right angles to the plane of the joints.

All units i.e. from unit II to unit-VI to be taught in Limit State Design and in Welded connections only.

UNIT – II Beams: Allowable stresses, design requirements as per IS Code-Design of simple and compound beams-Curtailment of flange plates, Beam to beam connection, check for deflection, shear, buckling, check for bearing, laterally unsupported beams.

UNIT –III Tension Members and compression members: General Design of members subjected to direct tension and bending –effective length of columns. Slenderness ratio – permissible stresses. Design of compression members, struts etc.

Roof Trusses: Different types of trusses – Design loads – Load combinations as per IS Code recommendations, structural details –Design of simple roof trusses involving the design of purlins, members and joints – tubular trusses.

UNIT – IV Design of Columns: Built up compression members – Design of lacings and battens. Design Principles of Eccentrically loaded columns, Splicing of columns.

UNIT – V Design of Column Foundations: Design of slab base and gusseted base. Column bases subjected moment.

UNIT – VI Design of Plate Girder: Design consideration – I S Code recommendations Design of plate girder-Welded – Curtailment of flange plates, stiffeners – splicing and connections.

Design of Gantry Girder: impact factors - longitudinal forces, Design of Gantry girders.

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: B.Tech Faculty Name: U.KRISHNA SAINATH

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	II	Environmental Engineering-I		19-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse

teams, and in multidisciplinary settings.

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11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.

2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

1. Interpret the water quantity for various types of demands
2. Identify the water source and select proper intake structure
3. Get the knowledge on characterization of water
4. Understand the treatment of raw water
5. Describe the miscellaneous treatment methods
6. Impart knowledge on water distribution networks

Course Outcomes:

1. Appraise the quantity of water required for a community
2. List with types of intakes
3. Examine the water characteristics
4. Discuss the Primary treatment of raw water.
5. Identify the Miscellaneous treatments.
6. Describe the distribution network.

Syllabus:

UNIT I

Introduction: Importance and Necessity of Protected Water Supply systems, Water borne diseases, Flow chart of public water supply system, Role of Environmental Engineer, Agency activities.
Water Demand and Quantity Estimation: Estimation of water demand for a town or city, Per capita Demand and factors influencing it - Types of water demands and its variations- factors affecting water demand, Design Period, Factors affecting the Design period, Population Forecasting

UNIT-II

Sources of Water: Lakes, Rivers, Impounding Reservoirs, comparison of sources with reference to quality, quantity and other considerations- Capacity of storage reservoirs, Mass curve analysis. Groundwater sources of water: Types of water bearing formations, springs, Wells and Infiltration galleries, Yields from infiltration galleries.

Collection and Conveyance of Water: Factors governing the selection of the intake structure, Types of Intakes. Conveyance of Water: Gravity and Pressure conduits, Types of Pipes, Pipe Materials, Pipe joints, Design aspects of pipe lines, laying of pipe lines

UNIT-III

Quality and Analysis of Water: Characteristics of water–Physical, Chemical and Biological-Analysis of Water – Physical, Chemical and Biological characteristics. Comparison of sources with reference to quality-I.S. Drinking water quality standards and WHO guidelines for drinking water

UNIT-IV

Treatment of Water: Flowchart of water treatment plant, Treatment methods: Theory and Design of Sedimentation, Coagulation, Sedimentation with Coagulation, Filtration.

UNIT-V

Disinfection: Theory of disinfection-Chlorination and other Disinfection methods, Softening of Water, Removal of color and odours - Iron and manganese removal –Adsorption-fluoridation and deflouridation–aeration– Reverse Osmosis-Iron exchange–Ultra filtration.

UNIT-VI

Distribution of Water: Requirements- Methods of Distribution system, Layouts of Distribution networks, Pressures in the distribution layouts, Analysis of Distribution networks: Hardy Cross and equivalent pipe methods -Components of Distribution system: valves such as sluice valves, air valves, scour valves and check valves, hydrants, and water meters–Laying and testing of pipe lines- selection of pipe materials, pipe joints.

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: CIVIL Faculty Name: Syed Imran

Class	Semester	Title of The Paper	Paper Code	W.E.F
III CIVIL	II	Waste Water Managemnt		19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 6	Practical ----	3 Hours	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. List the appropriate appurtenances in the sewerage systems
2. Discuss the Pumping of wastewater and design of building drainage system
3. Examine the waste water characteristics &design the preliminary and primary treatment units
4. Describe the secondary treatment of Sewage
5. Identify the Miscellaneous treatments and design the septic and imhoff tanks
6. State the suitable methods for sludge disposal

Course Objectives:

1. Get the knowledge of collection, conveyance and estimation of waste water and sewerage system and it's appurtenances
2. Get the knowledge of pumping and house plumbing systems of waste water and design of drainage
3. Learn the analysis of waste water and design the preliminary & primary treatment units
4. Understand secondary treatment methods of sewage
5. Get the idea about the miscellaneous treatment methods and working principles and design of septic and imhoff tanks
6. Handle the sludge and learn it's safe disposal.

SYLLABUS:

UNIT – I: Introduction to Sanitation – Systems of sanitation – relative merits & demerits – collection and conveyance of waste water – sewerage – classification of sewerage systems- Estimation of sewage flow and storm water drainage – fluctuations – types of sewers - Hydraulics of sewers and storm drains– design of sewers – appurtenances in sewerage – cleaning and ventilation of sewers

UNIT – II: Pumping of wastewater: Pumping stations – location – components– types of pumps and their suitability with regard to wastewaters.

House Plumbing: Systems of plumbing-sanitary fittings and other accessories– one pipe and two pipe systems – Design of building drainage

UNIT – III: Sewage characteristics – Sampling and analysis of wastewater - Physical, Chemical and Biological Examination-Measurement of BOD and COD - BOD equations

Treatment of sewage: Primary treatment-Screens-grit chambers-grease traps– floatation– sedimentation – design of preliminary and primary treatment units.

UNIT – IV: Secondary treatment: Aerobic and anaerobic treatment process- comparison.

Suspended growth process: Activated Sludge Process, principles, designs, and operational problems, modifications of Activated Sludge Processes, Oxidation ponds, Aerated Lagoons.

Attached Growth Process: Trickling Filters–mechanism of impurities removal- classification–design-operation and maintenance problems. RBCs, Fluidized bed reactors

UNIT V: Miscellaneous Treatment Methods: Nitrification and Denitrification – Removal of Phosphates –UASB–Membrane reactors-Integrated fixed film reactors. Anaerobic Processes: Septic Tanks and Imhoff tanks- working Principles and Design–Reuse and disposal of septic tank effluent, FAB Reactors.

UNIT – VI: Bio-solids (Sludge) management: Characteristics-SVI, handling and treatment of sludge-thickening – anaerobic digestion of sludge, Sludge Drying Beds. Centrifuge.

Disposal of sewage: Methods of disposal – disposal into water bodies-Oxygen Sag Curve-Disposal into sea, disposal on land- sewage sickness.

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: B.Tech Faculty Name: K.Prudhvi

Class	Semester	Title of The Subject	Subject Code	W.E.F
III	II	WRE-1		19-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	06		3	30	70	3

Programme Outcomes:

PO1: Engineering Knowledge: Apply knowledge of mathematics and science, with fundamentals of Computer Science & Engineering to be able to solve complex engineering problems related to CSE.

PO2: Problem Analysis: Identify, Formulate, review research literature and analyze complex engineering problems related to CSE and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3: Design/Development of solutions: Design solutions for complex engineering problems related to CSE and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.

PO4: Conduct Investigations of Complex problems: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to computer science related complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the CSE professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the CSE professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply Ethical Principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

1. Understand about hydrology, hydrological cycle and components of the hydrological cycle. And learn about types and forms, measurement, presentation, frequency of precipitation.
2. Learn the factors affecting, measurement and different aspects of evaporation, Evapotranspiration and infiltration.
3. Learn the factors affecting, measurement and different aspects of Run-Off and Provide an overview and understanding of Unit Hydrograph theory and its analysis by using different methods.
4. Understand flood frequency analysis by using Gumbels and Log pearson type-III distribution methods .Know the concept ,methods of Flood routing and causes and controlling methods of floods.
5. Understand about groundwater movement and well hydraulics and can determine aquifer parameters and yield of wells.
6. Study Advanced topics in Hydrology such as Rainfall-Runoff Modeling, IUH –Clark and Nash Models and general hydrological models –chow and Kulandaiswamy models

Course Outcomes:

1. Define hydrological cycle and types, forms, measurement and representation of precipitation
2. Appraise the processes of Evaporation, Evapotranspiration and infiltration losses.
3. Examine the knowledge of Run-Off and Hydrograph analysis.
4. Describe floods and carry out flood routing.
5. Appraise the knowledge of groundwater movement and well hydraulics.
6. Discuss the advanced topics in Hydrology.

Syllabus Unit Wise:

UNIT I Introduction: Engineering hydrology and its applications, Hydrologic cycle, hydrological data-sources of data.

Precipitation: Types and forms, measurement, raingauge network, presentation of rainfall data, average rainfall, continuity and consistency of rainfall data, frequency of rainfall, Intensity-Duration-Frequency (IDF) curves, Depth-Area-Duration (DAD) curves, Probable Maximum Precipitation (PMP), design storm

UNIT-II Abstractions from Precipitation: Initial abstractions.

Evaporation: factors affecting, measurement, reduction

Evapotranspiration: factors affecting, measurement, control

Infiltration: factors affecting, Infiltration capacity curve, measurement, infiltration indices.

UNIT-III Runoff: Catchment characteristics**,** Factors affecting runoff, components, computation- empirical formulae, tables and curves, stream gauging, rating curve, flow mass curve and flow duration curve.

Hydrograph analysis: Components of hydrograph, separation of base flow, effective rainfall hyetograph and direct runoff hydrograph, unit hydrograph, assumptions, derivation of unit hydrograph, unit hydrographs of different durations, principle of superposition and Shydrograph methods, limitations and applications of unit hydrograph, synthetic unit hydrograph.

UNIT-IV Floods: Causes and effects, frequency analysis- Gumbel's and Log-Pearson type III distribution methods, Standard Project Flood (SPF) and Probable Maximum Flood (MPF), flood control methods and management.

Flood Routing: Hydrologic routing, channel and reservoir routing-Muskingum and Puls methods of routing.

UNIT-V Groundwater: Occurrence, types of aquifers, aquifer parameters, porosity, specific yield, permeability, transmissivity and storage coefficient, types of wells, Darcy's law, Dupuit's equation- steady radial flow to wells in confined and unconfined aquifers, yield of a open well-recuperation test.

UNIT VI Advanced Topics in Hydrology: Rainfall-runoff Modelling, instantaneous unit hydrograph (IUH) - conceptual models - Clark and Nash models, general hydrological models- Chow - Kulandaiswamy model.

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: B.Tech in Civil Engineering Faculty Name: T.S.V.DURGA

Class	Semester	Title of The Paper	Paper Code	W.E.F
III	II	COMPUTER AIDED ENGINEERING DRAWING		19-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
45 Hours	Theory	Practical 3	3	Internal 30	External 70	2

Programme Outcomes:

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem** research literature, and analyze complex engineering problems reaching substantiated **analysis** Identify, formulate, conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:**

   Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:**

   Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:**

   Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:**

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

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12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues

2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

Draw the projections & development of surfaces of solids.

Draw the 3D views in different projections.

Create a plan & modeling of simple solids in CAD software.

Course Objectives:

Learn the projections , development of surfaces of solids and methods of isometric & perspective views.

Know about the CAD software and generation of solid modeling.

Course Syllabus:

UNIT-I

Objective: The knowledge of projections of solids is essential in 3D modelling and animation. The student will be able to draw projections of solids. The objective is to enhance the skills they already acquired in their earlier course in drawing of projection and sections of solids.

Projections Of Planes & Solids : Projections of Regular Solids inclined to both planes - Auxiliary Views. Sections and Sectional views of Right Regular Solids - Prism, Cylinder, Pyramid, Cone - Auxiliary views.

UNIT-II

Objective: The knowledge of development of surfaces of solids is required in designing and manufacturing of the objects. Whenever two or more solids combine, a definite curve is seen at their intersection. The intersection ofsolids also plays an important role in designing and manufacturing. The objective is to impart this knowledge through this topic.

Development And Interpenetration Of Solids: Development of Surfaces of Right Regular Solids - Prisms, Cylinder, Pyramid Cone and their parts. Interpenetration of Right Regular Solids - Intersection of Cylinder Vs Cylinder, Cylinder Vs Prism, Cylinder Vs Cone.

UNIT-III

Objective: Isometric projections provide a pictorial view with a real appearance. Perspective views provides a realistic 3D View of an object. The objective is to make the students learn the methods of Iso and Perspective views.

Isometric Projections : Principles of Isometric Projection - Isometric Scale

- Isometric Views

- Conventions - Isometric Views of Lines, Plane Figures, Simple and Compound Solids - IsometricProjection of objects having non- isometric lines. Isometric Projection of Spherical Parts.

Transformation of Projections: Conversion of Isometric Views to Orthographic Views - Conventions.

Perspective Projections: Perspective View: Points, Lines, Plane Figures and Simple Solids,Vanishing Point Methods(General Method only).

PART- B COMPUTER AIDED DRAFTING

UNIT- IV

Introduction To Computer Aided Drafting: Generation of points, lines, curves, polygons, dimensioning. Types of modelling: object selection commands - edit, zoom, cross hatching, pattern filling, utility commands, 2D wire frame modelling, 3D wire frame modelling.

UNIT-V

Objective: By going through this topic the student will be able to understand the paper-space environment thoroughly.

View Points And View Ports: view point coordinates and view(s) displayed, examples to exercise different options like save, restore, delete, joint, single option.

UNIT-VI

Computer Aided Solid Modelling: Isometric projections, orthographic projections of isometric projections, Modelling of simple solids, Modelling of Machines & Machine Parts.

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: B.Tech Faculty Name: B.Swetha Malika

Class	Semester	Title of The Subject	Subject Code	W.E.F
III	II	Geotechnical Engineering Lab		19-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours		06	3	30	70	3

Programme Outcomes:

PO1: Engineering Knowledge: Apply knowledge of mathematics and science, with fundamentals of Computer Science & Engineering to be able to solve complex engineering problems related to CSE.

PO2: Problem Analysis: Identify, Formulate, review research literature and analyze complex engineering problems related to CSE and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3: Design/Development of solutions: Design solutions for complex engineering problems related to CSE and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.

PO4: Conduct Investigations of Complex problems: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to computer science related complex engineering activities with an understanding of the limitations.

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Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

1. Familiarize with Classification of soils
2. Test the Index properties of a soil
3. Test the engineering properties of the soil

Course Outcomes:

1. Identify the classification of soil.
2. Appraise the index properties of soil sample
3. Appraise the engineering properties of soil sample

SYLLABUS:

LIST OF EXPERIMENTS

1. Specific gravity, G
2. Atterberg's Limits.
3. Field density-Core cutter and Sand replacement methods
4. Grain size analysis by sieving
5. Hydrometer Analysis Test
6. Permeability of soil - Constant and Variable head tests
7. Compaction test
8. Consolidation test (to be demonstrated)
9. Direct Shear test
10. Triaxial Compression test (UU Test)
11. Unconfined Compression test
12. Vane Shear test
13. Differential free swell (DFS)
14. CBR Test

HOD CIVIL DEPT.
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POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: CIVIL Faculty Name: Syed Imran

Class	Semester	Title of The Paper	Paper Code	W.E.F
III CIVIL	I	Environmental Engineering Lab		19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
40 Hours	Theory -	Practical 3	3 Hours	Internal 25	External 50	2

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Evaluate water quality based on chemical analysis of given samples

2. Appraise water quality based on physical analysis of given samples

Course Objectives:

1. Learn the laboratory practices to estimate the chemical properties like pH, alkalinity, acidity, hardness, chlorides, total, suspended and dissolved solids, D.O., B.O.D., COD and residual chlorine present in the water and waste water samples

2. Learn the laboratory practices to estimate the physical properties like turbidity in the water and waste water samples.

SYLLABUS:

List of Experiments

1. Determination of pH and Electrical Conductivity (Salinity) of Water and Soil.
2. Determination and estimation of Total Hardness–Calcium & Magnesium.
3. Determination of Alkalinity/Acidity
4. Determination of Chlorides in water and soil
5. Determination and Estimation of total solids, organic solids and inorganic solids and settleable solids by Imhoff Cone.
6. Determination of Iron.
7. Determination of Dissolved Oxygen with D.O. Meter & Wrinklers Method and B.O.D.
8. Physical parameters – Temperature, Colour, Odour, Turbidity, Taste.
9. Determination of C.O.D.
10. Determination of Optimum coagulant dose..

HOD CIVIL DEPT.
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology
Kothapet, VIJAYAWADA-520 001

Program Name: CIVIL Faculty Name: M Sudhakar

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV CIVIL	II	WSM		19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	6	----	3 Hours	30	70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Define the concept of watershed .
2. Identify suitable characteristics to take appropriate management action.
3. design control measures against soil erosion.
4. Choose suitable harvesting techniques for better watershed management.
5. Apply land grading techniques for proper land management .
6. Select appropriate models for watershed management**.**

Course Objectives:

1. Introduce the concept of watershed management
2. Understand the watershed characteristics and analyze the watershed parameters.
3. Learn the principles of soil erosion and measures to control erosion
4. Appreciate various water harvesting techniques.
5. Learn land management practices for various land use/land cover
6. Introduce concepts of watershed modelling.

SYLLABUS:

UNIT-I

Introduction: Concept of watershed development, objectives of watershed development, need for watershed development, Integrated and multidisciplinary approach for watershed management.

UNIT-II

Characteristics of Watersheds: Size, shape, physiography, slope, climate, drainage, land use, vegetation, geology and soils, hydrology and hydrogeology, socio-economic characteristics, basic data on watersheds.

UNIT-III

Principles of Erosion: Types and causes of erosion, factors affecting erosion, estimation of soil loss due to erosion- Universal soil loss equation. Measures to Control Erosion: Contour techniques, ploughing, furrowing, trenching, bunding, terracing, gully control, check dams , rock-fill dams, brushwood dam, Gabion.

UNIT-IV

Water Harvesting: Techniques of rain water harvesting- rain water harvesting from roof top, surface flow harvesting, subsurface flow harvesting, stop dams, farm ponds and dugout ponds, percolation tanks.

UNIT-V

Land Management: Land use and Land capability classification, management of forest, agricultural, grassland and wild land, land grading operation, Reclamation of saline and alkaline soils.

UNIT-VI

Watershed Modelling: Data of watershed for modelling, application and comparison of watershed models, model calibration and validation, advances of watershed models.

Prerequisites for the Course: Environmental Engineering, Environmental Science.

HOD CIVIL DEPT.
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VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: B.TECH Faculty Name: S.SNIGDHA

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	II	REPAIR AND REHABILITATION OF STRUCTURES	RT42014C	19/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
85 Hours	Theory 6	Practical -	3	Internal 30	External 70	3

PROGRAMME OUTCOMES:

PO1: Engineering Knowledge: Apply knowledge of mathematics and science, with fundamentals of Computer Science & Engineering to be able to solve complex engineering problems related to CSE.

PO2: Problem Analysis: Identify, Formulate, review research literature and analyze complex engineering problems related to CSE and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3: Design/Development of solutions: Design solutions for complex engineering problems related to CSE and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.

PO4: Conduct Investigations of Complex problems: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to computer science related complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the CSE professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the CSE professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply Ethical Principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.

<u>Programme Specific Outcomes:</u>

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

COURSE OUTCOMES:

1. Explain deterioration of concrete in structures

2. Carryout analysis using NDT and evaluate structures

3. Assess failures and causes of failures in structures

4. Explain different repair materials

5. Explain different repair techniques

6. Carryout Physical evaluation and submit report on condition of the structure.

COURSE OBJECTIVES:

1. Familiarize Students with deterioration of concrete in structures

2. Equip student with concepts of NDT and evaluation

3. Understand failures and causes for failures in structures

4. Familiarize different repair materials

5.Familiarize different techniques for repairs

6. Understand procedure to carryout Physical evaluation of buildings and prepare report.

<u>SYLLABUS:</u>

UNIT I : Stones, Bricks And Tiles Properties of building stones – relation to their structural

requirements, classification of stones – stone quarrying – precautions in blasting, dressing of

stone, composition of good brick earth, various methods of manufacturing of bricks.

Characteristics of good tile - manufacturing methods, types of tiles. Uses of materials like

Aluminium, Gypsum, Glass and Bituminous materials

UNIT II: Masonry Types of masonry, English and Flemish bonds, Rubble and Ashlar

Masonry. Cavity and partition walls. Wood: Structure – Properties- Seasoning of timber- Classification of various types of woods used in buildings- Defects in timber. Alternative materials for wood – Galvanized Iron, Fiber Reinforced Plastics, Steel, Aluminium.

UNIT-III

Failure of buildings: Definition of building failure-types of failures- Causes of Failures- Faulty Design, Accidental over Loading, Poor quality of material and Poor Construction practices- Fire damage - Methodology for investigation of failures-diagnostic testing methods and equipments-repair of cracks in concrete

UNIT-IV

Materials for repair and rehabilitation -Admixtures- types of admixtures- purposes of using admixtures- chemical composition- Natural admixtures- Fibres- wraps- Glass and Carbon fibre wraps- Steel Plates-Concrete behavior under corrosion, disintegrated mechanisms- moisture effects and thermal effects – Visual investigation- Acoustical emission methods- Corrosion activity measurement- chloride content – Depth of carbonation- Impact echo methods- Ultrasound pulse velocity methods- Pull out tests.

UNIT: V

Repair Techniques: Grouting, Jacketing, Shotcreting, externally bonded plates, Nailing, Underpinning and under water repair; Materials, Equipments, Precautions and Processes.

UNIT: VI

Investigation of structures: Distress, observation and preliminary test methods. Case studies: related to rehabilitation of bridge piers, dams, canals, heritage structures, corrosion and erosion damaged structures.

Program Name: B. Tech in Civil Engineering **Faculty Name:**U.Krishna Sainath

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV Year	II Semester	Estimating, Specifications & Contracts	RT42011	6

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical -	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.

2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

The student will:

1. Learn the General items, standard units and estimates of buildings.
2. Learn the rate analysis of various items of work..
3. Understand the Earthwork for roads & canals and Describe the bar bending schedule.
4. Generalize the types & conditions of contract, and standard specifications for different items of building and their valuation.
5. Interpret the estimation of buildings using individual wall method.
6. Interpret the estimation of buildings using centre line method.

Course Outcomes:

At the end of the Course/Subject, the students will be able to:

1. Recognize the General items and the standard units of works.
2. Value the rates for construction items.

3. Evaluate the earthwork for roads & canals and recognize the concept of bar bending schedule.
4. Discuss the conditions of contract and value the property.
5. Estimate the quantities and cost of a building using individual wall method.
6. Guesstimate the quantities and cost of a building using centre line method.

UNIT I

General items of work in Building – Standard Units Principles of working out quantities for detailed and abstract estimates –Approximate method of Estimating.

UNIT-II

Rate Analysis – Working out data for various items of work over head and contigent charges.

UNIT-III

Earthwork for roads and canals, Reinforcement bar bending and bar requirement schedules.

UNIT-IV

Contracts – Types of contracts – Contract Documents – Conditions of contract, Valuation of buildings Standard specifications for different items of building construction.

UNIT-V

Detailed Estimation of Buildings using individual wall method.

UNIT-VI

Detailed Estimation of Buildings using centre line method.

HOD CIVIL DEPT.
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Kothapet, VIJAYAWADA-520 001

Program Name: B.Tech Faculty Name: B.SWETHA MALIKA

Class	Semester	Title of The Paper	Paper Code	W.E.F
IV	II	Traffic Engineering	RT42012E	6

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 4	Practical	3	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse

teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.

2. Qualify in competitive examinations for higher education and employment.

<u>Course Objectives:</u>

1. To know various components and characteristics of traffic.
2. To know various traffic control devices and principles of highway safety.
3. To understand the detrimental effects of traffic on environment
4. To know highway capacity and level of service concepts.
5. To learn about intelligent vehicle highway systems.

<u>Course Outcomes:</u>

1. Determine traffic speed, volume, travel time and density.
2. Design traffic signals
3. Determine highway capacity.
4. Design Intersections and prepare traffic management plans.
5. Apply the gained knowledge to techniques on safety Environment.

<u>Syllabus:</u>

UNIT I

Components Of The Traffic System: Human-Vehicle–Environment System; characteristics of Road users, Vehicles, Highways and their classification; Traffic Studies:Inventories; Volume studies; Speed, Travel time and Delay studies; Intersection studies; Pedestrian studies; Parkingstudies; Accident studies.

UNIT-II

Traffic Characteristics: Microscopic and macroscopic flow characteristics: Time headways; Temporal, spatial and model flow patterns; Interrupted and Un interrupted traffic. Microscopic and macroscopic speed characteristics: Vehicular speed Trajectories; Speed characteristics – Mathematical distribution; Speed and travel time variations; Travel time and delay studies. Microscopic and Macroscopic density characteristics: Distance headway characteristics; Car-following theories; Density measurement techniques; Density contour maps.

UNIT-III

Traffic Control Devices & Highway Safety: Traffic signs & Markings; Signal Warrants; Signal phasing and Development of phase plans; Fixed and Vehicle activated signals; Webster method; ARRB method; Drew‟s Method; IRC method; Signal coordination; Area Traffic control. Accident characteristics – Road – Driver – Vehicle; Accident recording and Analysis; Highway Safety Improvement Program; Safety Audit.

UNIT-IV

Environmental Considerations: Air pollution: Kinds of pollutants; Air pollution standards; Measures of air quality; modelling and control. Noise pollution: Measurement of sound levels; Acceptable limits, Prediction of noise levels, Traffic noise control.

UNIT-V

Highway Capacity And Level Of Service: Capacity and level of service; Factors affecting Capacity and LOS; Capacity of Rural Highways, Capacity of Urban Roads; HCM and IRC standards.

UNIT-VI

Intelligent Vehicle – Highway Systems: Traffic surveillance and monitoring; IVHS programs, Role of IVHS, IVHS categories, Benefits and Costs of IVHS.

HOD CIVIL DEPT.
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Kothapet, VIJAYAWADA-520 001

Program Name: M.B.A Faculty Name: S.Praveen

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	I	Accounting for managers	MB 1613	13-08-2017

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
64	Theory 4	Practical ----	3 Hours	Internal 40	External 60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.

PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Financial Accounting information is designed primarily to assist investors and creditors in deciding where to place their scarce investment resources. Such decisions are important to society, as they determine which industries and companies and even countries will receive the financial resources necessary for growth, and which will not. Many other decision makers also make use of financial accounting information. A company's manager and employees constantly need such information in order to run and control business operations.

Course outcomes

1.Understand the nature and role of the four principal financial statements (i.e., the Income Statement, the Statement of Financial Position, the Statement of Cash Flows, and the Statement of Changes in Equity) ;
2. Develop an awareness and understanding of the accounting process and fundamental accounting principles that underpin the development of financial statements

3. Ability to read, interpret and analyse financial statements and combine financial analysis with other information to assess the financial performance and position of a company;
4. Understand and apply course concepts to analyse common business management decisions such as pricing and outsourcing decisions from a financial perspective

5.Analze the cvp analysis , BEP analysis,behavior classification costs and cvp under conditions of uncertainity

Course Objectives:

1. learning the nature and role of the four principal financial statements (i.e., the Income Statement, the Statement of Financial Position, the Statement of Cash Flow and the Statement of Changes in Equity)
2. understanding of the accounting process and fundamental accounting principles that underpin the development of financial statements
3. Understand to read, interpret and analyse financial statements and combine financial analysis with other information to assess the financial performance and position of a company
4. Analyzing the cvp analysis , BEP analysis,behavior classification costs and cvp under conditions of uncertainity

SYLLABUS:

UNIT 1
Accenting process: Definition of accounting - Accounting Concepts and conventions - Accounting
Cycle - Classification of accounts - Accounting equations – Static and dynamic nature of accounting -
Users of accounting information - Books of original entry, ledger - Preparation of Trial balance
UNIT-2
Final Accounts: Preparation and Presentation of income statement - Balance Sheet with Adjustments
- Accounting standards - Preparation and Presentation of Company Final Accounts – Limitations of
Financial Statements
UNIT-3
Financial Analysis: The scope and purpose of financial analysis - financial statement analysis - Ratio
analysis – liquidity, activity, structural, coverage and profitability ratios - Funds flow analysis - concepts of funds; ascertaining funds from operations ; Sources of funds - Uses of funds - Preparation
and analysis of funds flow statement and cash flow statement.
UNIT-4
Cost accounting concepts: Methods of Costing, Techniques of Costing - Role of Cost accounting -
Elements of cost - Financial accounting Vs Management Accounting - Basic Cost concepts - Determination of product cost - Preparation of cost sheet under different cost heads
UNIT-5

Cost behavior and Decision making: Behavioural classification of costs and methods for calculation of fixed, variable and semi variable costs - CVP analysis and decision making - Break Even analysis- Key factor distribution & analysis - Optimization of Product mix - Make or Buy decisions - Capacity utilization - Plant shutdown or continue decision CVP under conditions of uncertainty - sensitivity analysis.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Vijaya Kumar.P, Ravindra P.S., Kiran Kumar V: "**Accounting for Managers**", Himalaya Publishing House, New Delhi, 2013
2. Shankarnarayana, Ramanath: "**Finanacial Accounting for Management**", Cengage Learning, New Delhi.
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4. Maheshwari, Maheashwari and Maheshwari, "**Financial Accounting**", Vikas publishing House, New Delhi,2013
5. Amberish Gupta:"**Financial Accounting for Management**", Pearson Education, 2012.
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7. Asish K. Bhattacharyya: "**Essentials of Financial Accounting**", PHI Learning, New Delhi, 2012.
8. Dr. V.R.Palanivelu: "**Accounting for Management**". University Science Press, New Delhi, 2009.
9. Ashok Banerjee: "**Financial Accounting**", a managerial Emphasis, Excel books, New Delhi..

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VIJAYAWADA - 520 001.
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Program Name: M.B.A Faculty Name: SK.KHASIM

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	I	BUSINESS ENVIRONMENT	MB 1615	13-08-2017

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.
PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

All business enterprises, functions within an environment, called as the business environment. An individual business firm survives and grows within the periphery of its environment. A firm is only a part of a big environment, and so there are only a few factors which are under the control of the firm. So, the firm has no other option, but to respond and adapt accordingly. If business persons possess a good understanding of the business environment, they can easily recognise, analyse and react to the forces that affect the firm.

Course Outcomes:

1. Understand internal and external factors which have greater impact on the organizations and various Industrial policies and five year plans
2. Discuss various sickness in Indian industries and Disinvestment mechanism followed by the government to privatize the sectors.
3. Critically analysed recent fiscal policy of government
4. Understand various WTO and GATT agreements and mechanism which is used for free international trade between nations.
5. Provides awareness regarding consumer courts and redressalgrieviances to protect from unfair trade practices and other environmental laws

Course Objectives:

1. To understand national and international problems that are challenged by the organizations
2. To understand Economic systems and reforms in various sectors provided by the government for low captive industries
3. To give awareness regarding Balance of payments, Public revenues and public debts
4. To know different bilateral and multilateral agreements and treaties which placed between nations.
5. To know different Acts which are helpful for consumers and also acts for environment protection

SYLLABUS

UNIT 1
Business Environment: Importance at national and international level – problems and challenges
– factors both internal and external influencing business environment. Industrial policies since independence and their significance – regulatory and promotional framework - Five-year plans and
their importance.
UNIT 2
Structure of Indian economy: Nature and significance – Economic systems – structure of Indian
industry – Economic reforms in various sectors – nature – challenges – social justice – Disinvestment mechanism – problems and procedures – Sickness in Indian industry, competition Act 2002.
UNIT 3
Fiscal Policy: Nature and significance – public revenues – expenditure- debt, development activities allocation of funds – Critical analysis of the recent fiscal policy of Government of India -
Balance of Payments - Nature – Structure – major components – Causes for disequilibrium in Balance of Payments – Correction measures.
UNIT 4
India's Trade Policy: Nature – Magnitude and direction of Indian international trade – problems –
bilateral and multilateral trade agreements. International business environment: Nature – significance– challenges and mechanisms. WTO: Agreements in the Uruguay round including TRIPS, TRIMS and GATS – disputes settlement mechanism – dumping and antidumping measures.
UNIT 5
Legal Frame: special features of the SICA (special provisions) 1985, BIFR, Consumer protection
act 1986, Environmental laws (pertaining to the control and prevention of Air and Water pollution)
and the Essential Commodities Act 1955.
Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.
References:

1. Shaikh Saleem: "**Business Environment**", Pearsons, New Delhi,
2. Veena Keshav Pailwar: "**Economic Environment of Business**", PHI Learning, New Delhi, 2012
3. Rosy Joshi, Sangam Kapoor: "**Business Environment**", Kalyani Publishers, New Delhi, 2011.
4. Aswathappa K: "**Essentials of Business Environment**", Himalaya Publishing House, New Delhi, 2011.
5. Vivek Mittal: "**Business Environment Text and Cases**", Excel Books New Delhi, 2011.
6. Sundaram and Black: "***International Business Environment Text and Cases***", PHI Private
Limited, New Delhi.
7. Avid W Conklin: "***Cases in Environment of Business***", Sage Publication India Private Ltd,
New Delhi.
8. Raj Kumar: "**International Business Environment**", Excel Publication, New Delhi, 2012.
9. Palle Krishna Rao: "***WTO-Text and Cases***", Excel Publication, New Delhi.
10. Government of India, ***Latest Economic Survey Report***.

PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
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PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

<u>Programme Specific Outcomes:</u>

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

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SYLLABUS

UNIT 1

Business Environment: Importance at national and international level – problems and challenges – factors both internal and external influencing business environment. Industrial policies since independence and their significance – regulatory and promotional framework - Five-year plans and their importance.

UNIT 2

Structure of Indian economy: Nature and significance – Economic systems – structure of Indian industry – Economic reforms in various sectors – nature – challenges – social justice – Disinvestment mechanism – problems and procedures – Sickness in Indian industry, competition Act 2002.

UNIT 3

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UNIT 5

Legal Frame: special features of the SICA (special provisions) 1985, BIFR, Consumer protection act 1986, Environmental laws (pertaining to the control and prevention of Air and Water pollution) and the Essential Commodities Act 1955.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

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8. Raj Kumar: "**International Business Environment**", Excel Publication, New Delhi, 2012.
9. Palle Krishna Rao: "***WTO-Text and Cases***", Excel Publication, New Delhi.
10. Government of India, ***Latest Economic Survey Report***.

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Program Name: M.B.A Faculty Name: A.NAVEEN

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	I	Managerial Communication and Soft Skills	MB1614	13-08-2017

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
64	Theory 4	Practical ----	3 Hours	Internal 40	External 60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
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Programme Specific Outcomes:

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PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
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Course Context and Overview:

Knowledge of Managerial Communication and Soft Skills helps a manager to communicate effectively in corporate business world. This knowledge helps in interpersonal communication,cross culture communication and a removal of barriers of communication there by enabling the manager to empower himself with excellence.

Course Outcomes:

1. Develop and write clear, grammatically correct and coherent letters, memos and reports, that meet professional standards
2. Analyze the Formal and Informal Communication , Intrapersonal Communication.Models for Inter Personal Communication and Exchange Theory.

3.Evaluate the role of Inter-Personal communication, Role of Emotion in Inter Personal Communication Communication Styles and Barriers to Communication.

4. Infer the Significance of Business Correspondence, Essentials of Effective Business

Correspondence, Business Letter and Forms , Meeting and methods of Telephone Communication and Use of Technology in Business Communication.

5. Appreciate the Techniques of Presentation , Types of Presentation ,Video Conferencing and Formats Interview formal and informal Interview techniques

Course Objectives:

1.To Recognize different styles of communication and how to improve understanding and build rapport with others.
2.To Reflect on different methods of communication and decided when each is most suitable.
3. To Appreciate the role of body language and voice tone in effective communication.
4. To Communicate their message in an effective and engaging way for the recipient.

5.To Understand the process of telephonic conversation and to remove barriers to communication.

SYLLABUS

Managerial Communication & Soft Skills
UNIT 1
Role of Communication in Business: Objective of Communication – The Process of Human Communication – Media of Communication - Written Communication - Oral Communication - Visual Communication - Audio Visual Communication – Silence - Developing Listening Skills – Improving Non-verbal communication skills – Cross Cultural Communication – problems and challenges.
UNIT 2
Managing Organization Communication: Formal and Informal Communication - Intrapersonal Communication – Models for Inter Personal Communication - Exchange Theory.
UNIT 3
Managing Interpersonal Communication: Inter-Personal communication – Role of Emotion in Inter Personal Communication – Communication Styles – Barriers to Communication – Gateways to Effective Interpersonal Communication.
UNIT 4
Business Writing Skills: Significance of Business Correspondence - Essentials of Effective Business Correspondence - Business Letter and Forms - Meeting - Telephone Communication – Use of Technology in Business Communication. Report Writing – Meaning and Significance: Structure of Reports - Negative, Persuasive and Special Reporting: Informal Report – Proposals. Formal Reports.
UNIT 5

Presentation skills – Techniques of Presentation – Types of Presentation – Video Conferencing and
formats – Interview – formal and informal – Interview techniques –Communication etiquettes.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Mallika Nawal: "Business Communication", Cengage Learning, New Delhi, 2012.
2. Kuberudu B and Srinivasa Krishna K: "***Business Communication and Soft Skills***", Excel Books, 2008.
3. Meenakshi Rama: "***Business Communication***", Oxford University Press, New Delhi
4. C.S.G. Krishnamacharyulu and Dr. Lalitha Ramakrishnan, Business Communication, Himalaya Publishing House, Mumbai
5. Paul Turner: "***Organisational Communication***", JAICO Publishing House, New Delhi.
6. SathyaSwaroopDebasish, Bhagaban Das" "***Business Communication***", PHI Private Limited, New Delhi, 2009.
7. R.K.Madhukar: "**Business Communication**", Vikas Publishing House, New Delhi, 2012.
8. Kelly M Quintanilla, Shawn T.Wahl:"**Business and Professional Communication**", SAGE, New Delhi, 2012.
9. Sangita Mehta, NeetyKaushish: "**Business Communication**", University Science Press, New Delhi, 2010.
10. Anjali Ghanekar: "**Business Communication Skills**", Everest Publishing House, New Delhi.

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Program Name: M.B.A Faculty Name: S.MANIKANTA

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	I	Managerial Economics	**MB 1616**	

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
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	situations.
PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
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Course Context and Overview:

Knowledge of principles of Managerial Economics provides the manager an opportunity to apply these ideas in real world situation it helps the managers to make the company profit making enterprises therefore it provides a win-win situation for the company and corporate Business World.

Course Outcomes:

1.Understand the nature and scope of Managerial Economics and its relation with other subjects.

2.Analyse the concept of Price Elasiticity of demand and Demand Forecast Techniques and Law Of Supply

3.Infer the nature of Cobb-Douglas production function and Returns to Scale and Marginal Rate Of Technical Substitution

4.Analyze the theory of Cost Estimation and Profit Analysis and Break Even Analysis

5.Analyze the concept of Monopoly and Monopolistic Competition and Marris and Williamsons model of firms.

Course Objectives:

1. Apply the basic theories of economics in critical thinking and problem solving. .
2. Demonstrate an awareness of their role in the global economics environment.
3. Make decisions wisely using cost-benefit analysis.
4. Understand Demand, Supply and Production analysis.
5. Understand different types of markets existed in the long run and short run.

SYLLABUS

Managerial Economics

UNIT 1:
Introduction to Managerial Economics: Definition, Nature and Scope, Relationship with other areas in
Economics, The role of managerial economist. Concept of opportunity cost, Incremental concept, time
Perfective, Discounting Principle , Risk & uncertainty.

UNIT 2:
Demand Analysis: Elasticity of demand, types and significance of Elasticity of Demand - Measurement of price Elasticity of Demand – Need for Demand forecasting, forecasting techniques,
law of Supply, Elasticity of Supply.

UNIT 3:
Supply and Production Analysis: Production function, Marginal Rate of Technical Substitution, Production function with one/two variables, Cobb-Douglas Production Function, Returns to Scale and
Laws of returns.

UNIT 4:
Cost theory and estimation: Cost concepts, determinants of cost, cost – output relationship in the short
run and long run – Modern development in cost theory – Saucer shaped short – run Average cost curves
– Average total cost curve – Cost - Volume – Profit analysis

UNIT 5:
Market Structure and Pricing practices: Features and Types of different Markets – Price- Output determination in Perfect competition, Monopoly, Monopolistic competition and Oligopoly both in the
long run and short run. Pricing methods in practice – Bain's limit pricing theory - Managerial Theories

of a firm – Marris & Williams Models.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Paul, Koushil: "**Managerial Economics**", Cengage Learning, New Delhi,
2. Siddiqui S A,Siddiqui A S: "**Managerial Economics**", and Financial Analysis", New Age International Publishers, New Delhi, 2008.
3. Vanita Agarwal: "**Managerial Economics**", Pearson, New Delhi, 2013.
4. Dominick Salvatore: "**Managerial Economics**", Oxford University Press, New Delhi,2010.
5. D.L. Ahuja: "**Managerial Economics**", S. Chand & Company ltd,New Delhi-55.
6. O'Sullivan, Sheffrin, Perez "Micro Economics: Principles, Applications and Tools", Pearson Education.
7. Mithani D M: '**'Managerial Economics**", Himalaya Publishing House, Mumbai, 2008.
8. Atmanand: "**Managerial Economics**", Excel Publications. New Delhi, 2012.
9. Varshney, R.L and Maheswari, K L: '**'Managerial Economics**", Sultan Chand and Sons, New Delhi, 2002.

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Program Name: M.B.A Faculty Name: Dr. Vijay Durga Prasad

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	I	Principles of management	MB1611	16-08- 2017

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
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Course Context and Overview:

Examination of Principles of Management theory and provide opportunities for application of these ideas in real world situations. This examination focuses on the managerial functions of Assessing, Planning, Organizing, and Controlling. Both traditional and cutting-edge approaches are introduced and applied. Specific attention is paid throughout the course to the ethical implications of managerial action and inaction.

Course Outcomes:

1. Analyze the various functions of management and various theories of management including classical theory, Behavioral theory and Technical theory

2. Infer the nature of planning process, delegation of authority, span of Management and centralization and de- centralization of authority.
3. Explore the various techniques of controlling process and Leadership styles, in cross-cultural environment.
4. Describe the decision making process , rationale of decision making and Vroom's participative decision making model.
5 Appraise various contemporary management practices like Balace score card , B.P.O, T.Q.M , stress management ,J.I.T etc

Course Objectives:

1. Evaluate the global context for taking managerial actions of planning, organizing and controlling.
2. Assess global situation, including opportunities and threats that will impact management of an organization.
3. Integrate management principles into management practices.
4. Assess managerial practices and choices relative to ethical principles and standards.
5. Specify how the managerial tasks of planning, organizing, and controlling can be executed in a variety of circumstances.
6. Determine the most effective action to take in specific situations.

SYLLABUS

Unit 1: Introduction of Management:

Management: Definition – Importance – Managerial Roles – Functions of management – Classical theory – Scientific management - Administrative theory – Behavioral Theory – Management science – Integrative perspective – System theory – Socio – technical theory – Contingency theory – Comparing theories

Unit 2 Planning and Organizing: Nature and Definition of Planning – Principles of Planning – Objectives of planning – Planning process – Types of plans – Benefits and pitfalls of planning. Principles of organizing – Organization levels – Organizational designs and structure – Line and staff organizations – Approaches – Delegation of authority – Factors affecting delegation of authority – Span of management – Centralization and decentralization of Authority.

Unit 3 Directing and controlling: Definition of Co-ordination – Significance and principles of Coordination– Leadership behavior and styles – Leadership in cross cultural environment. Nature and importance of controlling – Controlling process – Requirements of effective control – Establishing controlling system – Controlling techniques.

Unit 4 Decision making: Meaning of decision – types of decisions – Rationale decision making process – Models of decision making – Problem solving and decision making – increasing participation in decision making – Vroom's Participative decision making model – challenges and problems in decision making

Unit 5 Contemporary issues in Management: MBO - Management By Walking Around – Out of the Box Thinking – Balanced Score Card –Time Management –BPOs – Stress Management causes and remedies – JIT – TQM – Six Sigma – CMM levels Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

REFERENCES:

1. Kumar ,Rao, Chhalill: Introduction to Management Science . Cengage Publications, New Delhi
2. Dilip Kumar Battacharya, Principles of Management, Pearson, 2012.
3. Harold Koontz, Heinz Weihrich, A.R.Aryasri, Principles of Management, TMH, 2010.
4. V.S.P.Rao, Management Text and Cases, Excel, Second Edition, 2012.
5. K.Anbuvelan, Principles of Management, University Science Press, 2013.
6. Neeta Baporikar, Case Method – Cases in Management, Himalaya Publishing House (HPH) 2009.
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COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: M.B.A Faculty Name: J.NAVEEN GUPTA

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	I	Q.A.B.D	MB1616	13-08-2017

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
64	Theory 4	Practical ----	3 Hours	Internal 40	External 60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.

PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Quantitative analysis is using data from your business to determine its success. It helps you look at data to determine what needs to be changed in the company or what is working for the company. You can use quantitative analysis to make purchasing decisions, marketing decisions, and even sales decisions..

Course Outcomes:

1. Analyze the concept of permutation and combination matrices and regression on analysis and measurement of dispersion
2. Infer the concept of Decision theory, Decision Criteria and graphic display of decision
3. Appreciate the concept of Linear Programmed, Simplex Method and two phase method.
4. Analyze the Game theories, Trasnportation problem and Assignment Problems
5. Understand the Concept of PERT, CPM, Replacement Models and Project Crashing Technique

Course Objectives:

1. Understand why statistics are important for making business decisions (when to use quantitative analysis vs. "common sense")
2. Explain the merits and limitations of various statistical techniques
3. Analyze to interpret statistical information and be able recognize when meaningful statistics are (and are not) being used
4. Explain the performance statistical analysis on paper as well as using Excel and SPSS where appropriate
5. Infer the quantitative techniques to solve a variety of business problems

<u>SYALLABUS</u>

Quantitative Techniques for Business Decisions
UNIT 1
Basic Mathematical & Statistical Techniques**:** Linear, Quadratic, Logarithmic and Exponential Functions- Permutations and Combinations – Matrices - Elementary operations of matrices. Measures
of Central Tendency – Measures of Dispersion –Simple Correlation and
Regression Analysis
Concept of Probability- Probability Rules – Joint and Marginal Probability – Baye's
Theorem- Probability Distributions- Binomial, Poisson, Normal and Exponential Probability Distributions.
UNIT 2
Introduction to Decision Theory: Steps involved in Decision Making, different environments in which
decisions are made, Criteria for Decision Making, Decision making under uncertainty, Decision making
under conditions of Risk-Utility as a decision criterion, Decision trees, Graphic displays of the decision
making process, Decision making with an active opponent.
UNIT 3
Linear Programming: Formation of mathematical modeling, Graphical method, the Simplex Method;
Justification, interpretation of Significance of All Elements In the Simplex Tableau, Artificial variable
techniques: Big M method, Two phase method.
UNIT 4
Transportation, Assignment Models & Game theory: Definition and application of the transportation
model, solution of the transportation problem, the Assignment Model, Traveling Salesman Problem.
Game Theory: Introduction – Two Person Zero-Sum Games, Pure Strategies, Games with Saddle Point,
Mixed strategies, Rules of Dominance, Solution Methods of Games without Saddle point – Algebraic,
matrix and arithmetic methods.

UNIT 5

P.E.R.T. & C.P.M. and Replacement Model: Drawing networks – identifying critical path – probability
of completing the project within given time- project crashing – optimum cost and optimum duration.
Replacement models comprising single replacement and group replacement

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. N.D.Vohra: "***Quantitative Techniques in Management***", Tata-McGraw Hill Private Limited, New Delhi, 2011.
2. J. K. Sharma, "***Operations Research: Theory and Applications***", Macmillan Gupta S.P: "***Statistical Methods***", S. Chand and Sons, New Delhi,
3. Anand Sharma: "**Quantitative Techniques for Business decision Making**", Himalaya Publishers, New Delhi,2012;
4. D P Apte: "***Operation Research and Quantitative Techniques***", Excel Publication, New Delhi, 2013
5. Hamdy, A.Taha: "***Operations Research: An Introduction***", Prentice-Hall of India, New Delhi 2003.
6. Anderson: "**Quantitative Methods for Business**", Cengage Learning, New Delhi 2013

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Program Name: M.B.A Faculty Name: J.NAVEEN GUPTA

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	II	Business Research Methods	MB1621	20-01-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

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Course Context and Overview:

Business Research comprises "creative and systematic work undertaken to increase the stock of knowledge, including knowledge of humans, culture and society, and the use of this stock of knowledge to devise new applications."[1] It is used to establish or confirm facts, reaffirm the results of previous work, solve new or existing problems, support theorems, or develop new theories. A research project may also be an expansion on past work in the field. Research projects can be used to develop further knowledge on a topic, or in the example of a school research project, they can be used to further a student's research prowess to prepare them for future jobs or reports. To test the validity of instruments, procedures, or experiments, research may replicate elements of prior projects or the project as a whole.

Course Outcomes:

1.Analyze the role of Business Research , aims of Social Research , Pure Research vs Applied Research, Qualitative Research Vs Quantitative Research, Descriptive Research, Experimental Research and Testing of Hypothesis

2.Infer the concept of Database Tools and Techniques of Collecting Data, Methods of Collecting Data, Sampling Design And Sampling Procedures, Random Vs Non-Random Sampling Techniques, GuttMan scale and Likert Scale

3.Analyze the concept of Survey Research,Personal Interviews,Self-Administered Questionaries,Nature of Field Work,Principles of Good Interviews and classification of data

4.Appreciate the concept of Statistical Inference and Quality Control, Test Of Hypothesis, Null Hypothesis Vs Alternative Hypothesis,T-Test, Chi-Square Test,Statistical Quality Control And Attribute Charts

5.Understand The Concept Of Multivariate Analysis,Classification of Multivariatee Techniques Anlaysis Of Interdependence, Bi-Variatee Analysis and Analysis For Complex Experimental Design

Course Objectives:

1. Clearly identify and analyse business problems and identify appropriate and effective ways to
2. answer those problems
3. Understand and apply the major types of research designs
4. Formulate clearly defined research questions
5. Analyse and summarise key issues and themes from existing literature
6. Understand the ethical issues associated with the conduct of research

SYLLABUS

Course Content :

UNIT 1

Introduction : Nature and Importance of research, The role of business research, aims of social research, research process, pure research vs. applied research, qualitative research vs quantitative research, exploratory research, descriptive research and experimental research, ethical issues in business research. Research Process – Types of Research –Defining Research Problem – Formulation of Hypothesis – Testing of Hypothesis.

UNIT 2

Data Base: Discussion on primary data and secondary data, tools and techniques of collecting data. Methods of collecting data. Sampling design and sampling procedures. Random Vs. Nonrandom
sampling techniques, determination of sample size and an appropriate sampling design. Designing of Questionnaire –Measurement and Scaling – Nominal Scale – Ordinal Scale – Interval Scale – Ratio Scale – Guttman Scale – Likert Scale – Schematic Differential Scale.

UNIT 3

Survey Research and data analysis: media used to communicate with respondents, personal interviews, telephone interviews, self-administered questionnaires, selection of an appropriate survey research design, the nature of field work, principles of good interviews and field work management. Editing – Coding – Classification of Data – Tables and Graphic Presentation – Preparation and Presentation of Research Report.

UNIT 4

Statistical Inference & quality control: Tests of Hypothesis, Introduction to Null hypothesis vs alternative hypothesis, parametric vs. non-parametric tests, procedure for testing of hypothesis, tests of significance for small samples, application, t-test, Chi Square test. Statistical Quality Control Upper quality charts p charts LCL UCL, BAR CHARTS. Attribute charts and industrial applications.

UNIT 5

Multivariate Analysis: Nature of multivariate analysis, classifying multivariate techniques, analysis of dependence, analysis of interdependence. Bivariate analysis-tests of differences-t test for comparing two means and z-test for comparing two proportions and ANOVA for complex experimental designs.

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References

1. Navdeep and Guptha : "**Statistical Techniques & Research Methodology**", Kalyani Publishers
2. Willam G.Zikmund, Adhkari: "***Business Research Methods***", Cengage Learning, New Delhi, 2013.
3. S.Shajahan: "***Research Methods for management***", JAICO Publishing House, New Delhi, 2009.
4. UWE FLICK: "**Introducing *Research Methodology***", SAGE, New Delhi,2012.
5. Cooper R.Donald and Schindler S. Pamela: "***Business Research Methods***", 9/e, Tata MCGraw Hill, New Delhi.
6. M.V.Kulkarni: "**Research Methodology**" , Everest Publishing House, New Delhi, 2010.

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Program Name: M.B.A Faculty Name: S.Praveen

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	II	Financial management	MB1622	20-01-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
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Course Context and Overview:

Financial management focuses on ratios, equity and debt. Financial managers are the people who will do research and based on the research, decide what sort of capital to obtain in order to fund the company's assets as well as maximizing the value of the firm for all the stakeholders. It also refers to the efficient and effective management of money (funds) in such a manner as to accomplish the objectives of the organization. It is the specialized function directly associated with the top management. The significance of this function is not seen in the 'Line' but also in the capacity of the 'Staff' in overall of a company. It has been defined differently by different experts in the field.

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Course Outcomes:

1.Understand evolution of financial management and its role in comtemporary issues,profit maximization vs wealth maximization and goals of financial manager.

2. Analyze cash flows from a project, including operating, net working capital, and capital

spending,EBIT, Theories Of Capital Structure and EPS analysis.
3. Understand how to use the dividend growth model and capital asset pricing model to estimate equity costs and calculate yield to maturity to estimate bond costs, Time Vaule of Money, Payback Period and Accounting rate of return.
4. Infer the required return on projects of differing risk and how to use the required return in evaluating investment decisions and use the dividend growth, bonus shares,stocks with dividend policies of India.

5.Analyze the significance of the Working Capital,Cash Flows Models, Capital Budgeting, Credit Policies, Inventory Management, cash management models, credit policies and inventory

Course Objectives:

1. To measure risk and return and explain the trade-off between risk and return .
2. To calculate the value of various financial assets - annuities, bonds, stocks.
3. To list the primary sources of capital and incorporate their cost when making investment decisions-debt, preferred stock, common stock.
4. Estimate project cash flows to distinguish between value-creating and value destroying investments.
5.To appreciate the cash flows capital budgeting ,credit policies and Inventory Management.

SYLLABUS

FINANCIAL MANAGEMENT

UNIT 1

Financial Management: Concept - Nature and Scope - Evolution of financial Management - The new role in the contemporary scenario – Goals and objectives of financial Management - Firm's mission and objectives - Profit maximization Vs. Wealth maximization – Maximization Vs Satisfying - Major decisions of financial manager.

UNIT 2

Financing Decision: Sources of finance - Concept and financial effects of leverage – EBIT – EPS analysis. Cost of Capital: Weighted Average Cost of Capital– Theories of Capital Structure..

UNIT 3

Investment Decision: Concept of Time Value of money – Techniques of Time Value of Money – Nature and Significance of Investment Decision – Estimation of Cash flows – Capital Budgeting Process – Techniques of Investment Appraisal – Pay back period, Accounting Rate of Return, Time Value of Money – DCF Techniques- Net Present Value, Profitability Index and Internal Rate of Return.

UNIT-4

Dividend Decision: Meaning and Significance – Major forms of dividends – Theories of Dividends – Determinants of Dividend – Dividends Policy and Dividend valuation – Bones

Shares –Stock Splits – Dividend policies of Indian Corporate.

UNIT-5

Liquidity Decision: Meaning - Classification and Significance of Working Capital – Components of Working Capital – Factors determining the Working Capital – Estimating Working Capital requirement – Cash Management Models – Cash Budgeting – Accounts Receivables –Credit Policies – Inventory Management.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. P.Vijaya Kumar, M.Madana Mohan, G. Syamala Rao:"**Financial Management",** Himalaya Publishing House, New Delhi,2013.
2. Rajiv Srivastava, Anil Misra: "**Financial Management**", Oxford University Press, New Delhi,2012
3. Brigham,E.F: "**Financial Management Theory and Practice**", Cengae Learning, New Delhi, 2013
4. Prasanna Chandra: "**Financial Management Theory and Practice**", Tata McGrawHill 2011.
5. I.M. Pandey: "**Financial Management",** Vikas Publishers, New Delhi, 2013.
6. RM Srivastava, Financial Management, Himalaya Publishing house, 4th edition.
7. Khan and Jain: Financial Management, Tata McGraw Hill, New Delhi,

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Program Name: M.B.A Faculty Name: v.vijay durga prasad

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	I	Human resource Management	MB1623	20-01-2018

SYLLABUS

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Course Context and Overview:

Human resources overall purpose is to ensure that the organization is able to achieve success through people. HR professionals manage the human capital of an organization and focus on implementing policies and processes. They can specialise in recruiting, training, employee-relations or benefits. Recruiting specialists find and hire top talent. Training and development professionals ensure that employees are trained and have continuous development. This is done through training programs, performance evaluations and reward programs. Employee relations deals with concerns of employees when policies are broken, such as in cases involving harassment or discrimination.

Course Outcomes:

1. Analyze the evolution of HRM principles, ethical aspects of HRM, HRM policies, strategies to increase firms,roles in position HRD , aligning HR strategy with organizational strategy, HRM at global level and persepectives and challenges
2. Infer the Nature of HR planning sources of the Recruitment And Test And Interview Techniques , Training And Development and Retention and Job Analysis
3. Understand traditional and modern methods of performance appraisal, career development ,counseling,compensation concepts, current trends in compensation methods of performance appraisal
4. .Appreciate wage and salary administration, determines of Wages ,Payments Of Wages And Incentives Payment Schemes and Welfare Measures.
5. Analyze the concept of trade unions Employee Participation Schemes, Safety Of Work and Management Of Stress

Course Objectives

1. To identify the importance of human resources and their effective management in organizations
2. Demonstrate a basic understanding of different tools used in forecasting and planning human resource needs.
3. Analyze the key issues related to administering the human elements such as motivation, compensation, appraisal, career planning, diversity, ethics, and training.
4. Analyze the role of recruitment and selection in relation to the organization's business and HRM objectives in a Saudi Arabian context. This includes demonstrating the appropriate use of job descriptions, application forms and related staffing tools such as internet recruiting.
5. Develop, analyze and apply advanced training strategies and specifications for the delivery of training programs

SYLLABUS

HUMAN RESOURCE MANAGEMENT

UNIT 1

HRM: Significance - Definition and Functions – evolution of HRM- Principles - Ethical Aspects of HRM- - HR policies, Strategies to increase firm performance - Role and position of HR department –aligning HR strategy with organizational strategy - HRM at global perspectivechallenges
– cross-cultural problems – emerging trends in HRM.

UNIT 2

Investment perspectives of HRM: HR Planning – Demand and Supply forecasting - Recruitment and Selection- Sources of recruitment - Tests and Interview Techniques - Training and Development – Methods and techniques – Training evaluation - retention - Job Analysis – job description and specifications - Management development - HRD concepts.

UNIT 3

Performance Appraisal: Importance – Methods – Traditional and Modern methods – Latest trends in performance appraisal - Career Development and Counseling- Compensation, Concepts and Principles- Influencing Factors- Current Trends in Compensation- Methods of Payments - compensation mechanisms at international level.

UNIT 4

Wage and Salary Administration: Concept- Wage Structure- Wage and Salary Policies- Legal Frame Work- Determinants of Payment of Wages- Wage Differentials - Job design and Evaluation- - Incentive Payment Systems. Welfare management: Nature and concepts – statutory and non-statutory welfare measures – incentive mechanisms

UNIT 5

Managing Industrial Relations: Trade Unions - Employee Participation Schemes-Collective Bargaining–Grievances and disputes resolution mechanisms – Safety at work – nature and importance – work hazards – safety mechanisms - Managing work place stress.

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References

1. K Aswathappa: "***Human Resource and Personnel Management***", Tata McGraw Hill, New Delhi, 2013
2. N.Sambasiva Rao and Dr. Nirmal Kumar: "**Human Resource Management and Industrial Relations**", Himalaya Publishing House, Mumbai
3. Mathis, Jackson,Tripathy:"***Human Resource Management:Asouth-Asin Perspective***", Cengage Learning, New Delhi, 2013
4. Subba Rao P: "***Personnel and Human Resource Management-Text and Cases***", Himalaya Publications, Mumbai, 2013.
5. Madhurima Lall, Sakina Qasim Zasidi: "**Human Resource Management**", Excel Books, New Delhi, 2010

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Program Name: M.B.A Faculty Name: SK KHASIM SHA

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	II	Marketing management	MB1624	20-01-2018

SYLLABUS

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Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Business Research comprises "creative and systematic work undertaken to increase the stock of knowledge, including knowledge of humans, culture and society, and the use of this stock of knowledge to devise new applications."[1] It is used to establish or confirm facts, reaffirm the results of previous work, solve new or existing problems, support theorems, or develop new theories. A research project may also be an expansion on past work in the field. Research projects can be used to develop further knowledge on a topic, or in the example of a school research project, they can be used to further a student's research prowess to prepare them for future jobs or reports. To test the validity of instruments, procedures, or experiments, research may replicate elements

Course Context and Overview:

Marketing management employs tools from economics and competitive strategy to analyze the industry context in which the firm operates. These include Porter's five forces, analysis of strategic groups of competitors, value chain analysis and others.

In competitor analysis, marketers build detailed profiles of each competitor in the market, focusing on their relative competitive strengths and weaknesses using SWOT analysis. Marketing managers will examine each competitor's cost structure, sources of profits, resources and competencies, competitive positioning and product differentiation, degree of vertical integration, historical responses to industry developments, and other factors.

Marketing management often conduct market research and marketing research to perform marketing analysis.

Course Outcomes:
1.Infer the concepts of markets,marketing mix , product and production concept and societal concepts
2.Analyze the market segmentation, institutional/corporate clientle,market segmentation,basics of market segmentation, target markets and position strategy
3.Appreciate the objectives of pricing and methods of pricing,initiating price cuts and responding to competitor's price changes
4.Understand market communication process,communication mix, managing advertising sales promotions,public relations,direct marketing and sales force compensation
5.Infer evolution of marketing department,marketing implementation,control of marketing performance, annunal plan control and profitability control.

Course Objectives:

1. Understand the place and contribution of marketing to the business enterprise.
   2. Describe major bases for segmenting consumer and business markets; define and be able to apply the three steps of target marketing: market segmentation, target marketing, and market positioning
   3. Describe the components of the marketing mix; identify how the firms marketing strategy and marketing mix must evolve
   4. To identify the costs and benefits of marketing channels; discuss the firms and the functions involved in typical channels
   5. Identify the roles of advertising, sales promotion, public relations, personal selling, and direct marketing in the promotion mix

<u>SYALLABUS</u>

MARKETING MANAGEMENT

UNIT 1
Introduction to Marketing: Needs - Wants – Demands - Products - Exchange - Transactions - Concept of Market and Marketing and Marketing Mix - Product and Production Concept - Sales and Marketing Concept - Societal Marketing Concept - Indian Marketing Environment.

UNIT 2

Market Segmentation and Targeting: Identification of Market Segments - Consumer and Institutional/corporate Clientele - Segmenting Consumer Markets - Segmentation Basis – Evaluation and Selection of Target Markets – Developing and Communicating a Positioning Strategy.

UNIT 3

Pricing Strategy: Objectives of Pricing - Methods of Pricing - Selecting the Final price - Adopting price - Initiating the price cuts - Imitating price increases - Responding to Competitor’s price changes.

UNIT 4

Marketing Communication: Communication Process – Communication Mix - Managing Advertising Sales Promotion - Public relations and Direct Marketing - Sales force - Objectives of Sales force - Structure and Size - Sales force Compensation.

UNIT 5

Marketing Organization and Control: Evolution of Marketing Department - Organizing the Marketing Department - , Marketing Implementation - Control of Marketing Performance - Annual Plan Control - Profitability Control - Efficiency Control - Strategic Control.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Lamb, Hair, Sharma: “**MKTG**” Cengage Learning , New Delhi, 2013
2. Phillip Kotler: “**Marketing Management** “, Pearson Publishers, New Delhi, 2013.
3. Rajan Sexena: “**Marketing Management**”, Tata McGraw Hill, New Delhi, 2012.
4. R.Srinivasan: “**Case Studies in Marketing**”, PHI Learning, New Delhi, 2012
5. Tapan K Pand: “**Marketing Management**”, Excel Books, New Delhi, 2012
6. Paul Baines, Chris Fill, Kelly Page Adapted by Sinha K: “**Marketing**”, Oxford University Press, Chenni, 2013.

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Program Name: M.B.A Faculty Name: Dr. Vijay Durga Prasad

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	II	Organizational Behavior	MB1625	20-01-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
64	Theory 4	Practical ----	3 Hours	Internal 40	External 60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers

	Selected as experiential knowledge and team work will enable the business graduates real world situations.
PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Knowledge of principles of Organizational Behaviour provide opportunities for application of these ideas in real world situations. This examination focuses on the managerial functions of Leadership, Communication, Organizing, and Personality Development.Both traditional and cutting-edge approaches are introduced and applied. Specific attention is paid throughout the course to the ethical implications of managerial action and inaction.

Course Outcomes:

1.. Define, explain and illustrate a range of organisational behaviour theories;

2. Analyse the behaviour of individuals and groups in organisations in terms of organisational behaviour theories, models and concepts;

3. Apply organisational behaviour concepts, models and theories to real life management situations through case analysis;

4. Demonstrate a critical understanding of organisational behaviour theories and current

empirical research associated with the topics covered in this course; and,
5. Communicate effectively in oral and written forms about organisational behaviour theories and their application using appropriate concepts, logic and rhetorical conventions

Course Objectives:

1. Define basic organizational behavior principles, and analyze how these influence behavior in the workplace.
2. Analyze individual human behavior in the workplace as influenced by personality, values, perceptions, and motivations.
3. Evaluate the elements of group behavior including group dynamics, communication, leadership, power & politics and conflict & negotiation.
4. Understand your own management style as it relates to influencing and managing behavior in the organization systems.
5. Enhance critical thinking and analysis skills through the use of management case studies, personal application papers and small group exercise

SYLLABUS

UNIT 1:
Introduction - Nature and scope – linkages with other social sciences - Individual Roles and Organizational Goals - Perspectives of Human Behavior, Approach to Organizational behavior - models of organizational behavior.
UNIT 2:
Perceptual Management: Nature - Process – selection, organization and interpretation – Influencing factors **-**Motivation – Concepts - Needs and Motives and theories. Leadership and Motivating people - Leadership Theories. Attitudes and Values: formation - Types – Changes and Behavior Modification Techniques.
UNIT 3:
Personality Development: Nature - Stages, Determinants of Personality, - Johari Window - Transactional Analysis, Learning Processes - Theories, Creativity and Creative - Thinking. Leadership nature and skills. - Decision Making Process**:** Behavioral Dimensions, Groups and their formation - Group Dynamics, Informal Organizations, Group versus Individual Interaction.
UNIT 4
Inter-Personal Communication: Listening, Feedback, Collaborative Processes in Work Groups, Team Building, Team Decision Making, Conflict Resolution in Groups and Problem Solving Techniques.
UNIT 5
Organizations: Taxonomy, Elements of Structure, Determinants of Structure, Functional Aspects of Structure, Role Impingement, Stress in Organization. Principles and Design of Organizations, Organizational Culture, Power and Authority. . Organizational Development

processes, Change – Resistance to Change.- Interventions, OD techniques and applications.

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Program Name: M.B.A Faculty Name: U. Ravi kiran

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	II	Production and Operations management	MB1626	20-01-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
64	Theory 4	Practical ----	3 Hours	Internal 40	External 60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.

PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Production and Operations management is an area of management concerned with designing and controlling the process of production and redesigning business operations in the production of goods or services. It involves the responsibility of ensuring that business operations are efficient in terms of using as few resources as needed and effective in terms of meeting customer requirements. It is concerned with managing an entire production system which is the process that converts inputs (in the forms of raw materials, labor, and energy) into outputs (in the form of goods and/or services), as an asset or delivers a product or services. Operations produce products, manage quality and creates service. Operation management covers sectors like banking systems, hospitals, companies, working with suppliers, customers, and using technology.

Course Outcomes:

1. Analyze the Nature and Scope of Production Operations Management,Historical Evolutions, Roles and Responsibilities of Production Manager,Types Of Manufacturing Process And New Product Design
2. Infer the Stages in Production Planning and control ,GANTT charts,PPC in Mass Batch and Job Manufacturing, Aggregate Planning and Master Scheduling, MRP,CRP,Plant Location and layout and Optimal Productin Strategy
3. Appreciate Concepts of Automation, Technology Management,Waste Management,Quality Assurance, Stastical Quality Control,Control Charts Variable And Attributes And Acceptance Sampling And Inventory Control
4. Understanding basic concepts of Quality,Juran's Quality triology, Demings 14 principles, Quality improvement and Cost reduction, ISO 9000-2000,clauses and coverage and Six Sigma.
5. Analyze the concepts of Stores Management, Safety Stock And Inventory Control ,types of inventory, ABC,VED and FSMD analysis and Value Analysis.

Course Objectives

1. To acquire a working understanding of the roles or functions of production management in the context of business enterprise
2. To develop skills in solving production management problems
3. To explain the importance of quality control.
4. To demonstrate an understanding of the principles of just-in-time systems
5. To demonstrate an understanding of the principles underlying materials requirements planning

SYLLABUS

PRODUCTION & OPERATIONS MANAGEMENT

UNIT 1

Introduction: Overview & Definition of Production and Operations Management- Nature and Scope of Production and Operations Management-Historical Evolution –Role & responsibilities of the production manager - Types of Manufacturing Processes and Product Design.

UNIT 2

Production Planning and Control: Stages in PPC – Gantt – PPC in Mass, Batch, and Job Order Manufacturing- Aggregate planning and Master Scheduling, MRP, CRP. Maintenance management & Industrial Safety. Plant Location & Layout Planning- Factors influencing location - types of layouts. Capacity Planning – Optimal Production Strategies: Scheduling and Sequencing of Operations. Work Design: Method Study and Work Measurement - Work Sampling.

UNIT 3

Managing of Work Environment:– Automation --Technology Management -Waste Management. Quality Assurance and Quality Circles – Statistical Quality Control –Control Charts for Variables- Average, Range and Control charts for Attributes. Acceptance Sampling Plans. Purchase functions and Procedure - Inventory control – Types of Inventory– Safety stock

– Inventory Control Systems –JIT, VMI.

UNIT 4

Quality Improvement: Basic concepts of quality, dimensions of quality, Juran's quality trilogy, Deming's 14 principles, Quality improvement and cost reduction, ISO 9000-2000 clauses & coverage. Six Sigma, Productivity –factors affecting productivity, measurement & improvements in productivity - new product development and design - stages & techniques. Total Productive Maintenance (TPM).

UNIT 5

Stores Management: Objectives of Stores Management – Requirements for efficient. Management of Stores – safety stock Inventory Control - Different Systems of Inventory Control, Costs & Types of Inventory. – ABC, VED and FNSD analyses. Value Analysis– importance in cost reduction – concepts and procedures.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Panner Selvem: "**Production and Operation Management**", Prentice Hall of India, NewDelhi, 2012.
2. K.Aswathappa, K. Shridhara: "**Production & Operation Management**", Himalaya Publishing House, New Delhi, 2012
3. Ajay K Garg: "**Production and Operation Management**", TMH, New Delhi,2012
4. Deepak Kumar Battacharya: "**Production & Operation Management**", University Press, New Delhi, 2012
5. AlanMuhlemann, JohnOakland,jasti Katyayani: "**Production and Operation Management**", Pearson, New Delhi,2013

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Program Name: M.B.A　　　　　　　　Faculty Name: T.CHENNAKESAVULU

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	III	Advanced Management Accounting	MB 1636	12-07-2018

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.

PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
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Course Context and Overview:
Advanced Management Accounting contains leading- edge of innovative treatment management accounting issues used by Major Companies throughout world advanced management accounting a systematic management-oriented approach to advanced management topics each chapter is accompanied by cases to illustrate the concepts discussed . it also contains innovative business standards and modern approaches to the sub ject economy value added (EVA) approach also provides business professionals a tool for Cost Accounting And Management.

Course Outcomes:

1. Analyze the Employment of Management Accounting , Human Resource Accounting , Need for Harmonization of International Accounting Standards ,Role of Management Accountant for controller functions and Financial Accounting Control (FACO).
2. Infer the financial analysis: Comparative analysis, Common Size Analysis - Funds Flow Analysis ,Cash Flow Analysis.-Ratio Analysis , Trend analysis and Deprecation Models.
3. Understand the Budget, Budgetary Control: Types of Budgets,Financial Vs Operation Budgets – Short Term Vs Long Term Budgets, Preparation of Sales

Budgets ,Purchase Budgets- Expenditure Budgets for Material, and Labour and Overheads.

4. Appreciate Marginal Costing: Cost Concepts for Decision making – Decision Making Process, Decision Situations-Sales Volume Decisions, Pricing and Special Order Pricing Make ,Buy Decisions, Product Decisions- Addition and Deletion and Alteration of Mix.
5. Infer Standard Costing: Standard Costing and historical costing ,Establishment of cost standards, steps involved in standard costing ,Variance analysis: Material Variance , Labour Variance and Overhead Variance.

Course Objectives:

1. Evaluate the effectiveness of alternative management accounting techniques and to apply them to organisational cost management practices.
2. Appraise current management accounting techniques and practices in their organisational context.
3. Appreciate the organisational, social and environmental context of management accounting;
4. Appraise management accounting control systems design and implementation in organizations
5. Learn within teams – to co-operate with team members, to assume leadership and to manage differences and conflicts

SYLLABUS

ADVANCED MANAGEMENT ACCOUNTING

Unit – 1:

Introduction: Employment of Management Accounting – Human Resource Accounting – Need for Harmonization of International Accounting Standards – Role of Management Accountant for controller functions – Financial Accounting Control (FACO)-Management information System.

Unit - 2:

Financial Analysis: Comparative analysis – Common Size Analysis - Funds Flow Analysis – Cash Flow Analysis.-Ratio Analysis – Trend analysis – Deprecation Models.

Unit- 3:

Budget – Budgetary Control: – Types of Budgets – Financial Vs Operation Budgets – Short Term Vs Long Term Budgets – Preparation of Sales Budgets – Purchase Budgets- Expenditure Budgets for Material, Labour and Overheads – Construction of Cash Budget- Flexible Budget – Master Budget – Management Control and Budgeting – Performance Budgeting and Zero Based Budgeting.

Unit-4:

Marginal Costing: Cost Concepts for Decision making – Decision Making Process – Decision Situations-Sales Volume Decisions – Pricing and Special Order Pricing – Make / Buy Decisions – Product Decisions- Addition, Deletion and Alteration of Mix – Plant Shutdown Decision -Profit Planning- introduction of new product – planning of level of activity – Key factor – Foreign market offer .

Unit – 5:

Standard Costing: Standard Costing and historical costing – Establishment of cost standards – steps involved in standard costing – Variance analysis: Material Variance – Labour Variance – Overhead Variance - Sales Variance

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Charles T. Horn Gaxy L. Sundem.: “Introduction to Management Accounting” Konrk Publishers PVT Ltd, New Delhi.
2. S.P. Gupta: “Management Accounting” Sahitya Bhawan Publications, Agra 2002. 3. Manmohan and Goyal: “Management Accounting” Pearson Education.
4. V. Krishna Kumar: “Management Accounting” Mittal Publications, New Delhi.
5. Dr. Kulsreshtha and Gupta: “Practical Problem in Management Accounting” Tata Mc Graw Hill, New Delhi.
6. S.P. Jain and K.L. Narang: “Advanced Cost and Management Accounting” Kalyani Publishers, New Delhi.

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Program Name: M.B.A Faculty Name: S.Praveen

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	III	BANKING AND INSURANCE MANAGEMENT	MB 1637	12-07-2018

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
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PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.

PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
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Course Context and Overview:

In 1960, the State Banks of India was given control of eight state-associated banks under the State Bank of India (Subsidiary Banks) Act, 1959. These are now called its associate banks In 1969 the Indian government nationalized 14 major private banks, one of the big bank was Bank of India. In 1980, 6 more private banks were nationalized These nationalized banks are the majority of lenders in the Indian economy. They dominate the banking sector because of their large size and widespread networks. The Indian banking sector is broadly classified into scheduled and non-scheduled banks. The scheduled banks are those included under the 2nd Schedule of the Reserve Bank of India Act, 1934. The scheduled banks are further classified into: nationalized banks; State Bank of India and its associates; Regional Rural Banks (RRBs); foreign banks; and other Indian private sector banks. The term commercial banks refers to both scheduled and non-scheduled commercial banks regulated under the Banking Regulation Act, 1949.

Course Outcomes:

1. Analyze introduction to Banking: Introduction to Indian Financial System - Meaning of a Bank and Customer- Bank and customer Relationship - Role of commercial banks in Economic Development - Evolution of Banking in India – origin, nationalization, reforms and Financial Inclusion in India.
2. Infer the Uses of Bank Funds: Features of Bank Credit - types of lending - assessment of credit worthiness of a prospective borrower - management of credit process - different types of loans and their features and Loan Pricing.

3. Understand Regulation and Innovations in Banking System: Regulation of Bank Capital: The need to regulate Bank Capital - Concept of Economic Model - Concept of Regulatory Capital, Basel Accords I,II and III. and Banking Innovations
4. Appreciate Introduction to Insurance: Insurance as a Risk Management Tool- Principles of Insurance -Characteristics of Insurance contract - Functions of Insurers: Production, Underwriting, Rate Making and Managing Claims and Losses.
5. Infer the Life Insurance and General Insurance: The concept of Life Insurance - types of Life Insurance contracts - Tax treatment of Life Insurance- Life Insurance Products-Classification of Life Insurance and The Actuarial Science

Course Objectives:

1.To make the students understand the various services offered and various risks faced by banks.

2. To make them aware of various banking innovations after nationalization To give them an overview about insurance industry.

3. To make the students understand various principles, provisions that govern the Life General Insurance .

4.To analyse characteristics of Insurance Contract , functions of insurers, underwriting , rate making and managing claims and losses.

5.to appreciate concept of Life Insurance , Tax treatment of Life insurance ,Insurance products and provisions of life insurance contract.

SYLLABUS

BANKING AND INSURANCE MANAGEMENT

UNIT 1

Introduction to Banking: Introduction to Indian Financial System - Meaning of a Bank and Customer- Bank and customer Relationship - Role of commercial banks in Economic Development - Evolution of Banking in India – origin, nationalization, reforms and Financial Inclusion in India - Financial statements of banks with special focus on Indian banks - Financial statement analysis of banks: CAMEL Approach, Key Performance indicators- Sources of Bank Funds.

UNIT 2

Uses of Bank Funds: Features of Bank Credit - types of lending - assessment of credit worthiness of a prospective borrower - management of credit process - different types of loans and their features - Loan Pricing: The basic model, pricing fixed & floating rate loans, cost-benefit loan pricing, Customer Profitability Analysis - Non Performing Assets: - gross and net concept of NPAs, causes, implications & recovery of NPAs

UNIT 3

Regulation and Innovations in Banking System: Regulation of Bank Capital: The need to regulate Bank Capital - Concept of Economic Model - Concept of Regulatory Capital, Basel Accords I,II and III. - Banking Innovations - Core Banking Solution - Retail Banking -Products & Services: Nature, Scope, Future and Strategies - Plastic Money - National Electronic Funds Transfer - ATM - Mobile Phone Banking - Net Banking- Banc-assurance. Changing role of Banks as Financial Intermediaries. Customer service quality in Indian banking industry.

UNIT 4

Introduction to Insurance: Insurance as a Risk Management Tool- Principles of Insurance -Characteristics of Insurance contract - Functions of Insurers: Production, Underwriting, Rate Making, Managing Claims and Losses, Investment & Financing, Accounting & Record Keeping and other miscellaneous functions - Types of Insurers- Concept of Reinsurance, uses and advantages - Marketing channels: Agents & brokers –professionalism, remuneration, responsibilities, classification, criteria for appointment and capital adequacy norms for broker - an overview of IRDA.

UNIT 5

Life Insurance and General Insurance: The concept of Life Insurance - types of Life Insurance contracts - Tax treatment of Life Insurance- Life Insurance Products-Classification of Life Insurance - The Actuarial Science- Provisions of Life Insurance contracts - Special Life Insurance forms - Health and General insurance–Overview, Types, Third Party Administrators- Micro Insurance in India

References

1. Peter.S.Rose & Sylvia. C. Hudgins: “Bank Management & Financial Services”, Tata McGraw Hill New Delhi, 2010,
2. James S. Trieschmann, Robert E. Hoyt & David. W. Sommer B:“Risk Management & Insurance”, Cengage Learning, New Delhi
3. Reddy K S and Rao R N: “Banking & Insurance”, Paramount Publishing House 2013.
4. Vasant Desai: “Banks & Institutional Management”, Himalaya Publishing House 2010.
5. Harold. D. Skipper & W. Jean Kwon: “Risk Management & Insurance, Perspectives in a Global Economy”, Blackwell Publishing New Delhi.
6. NIA: “Life Insurance Principles and Practices”, Cengage Learning, New Delhi,2013.
7. Neelam C.Gulati: “Banking and Insurance: Principles and Practice”, Excel Books, New Delhi 2011.

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Program Name: M.B.A   Faculty Name: S.Praveen

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	I	COSUMER BEHAVIOURt	MB 1640	12-07-2018

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.

PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Consumer behaviour is the study of individuals, groups, or organizations and all the activities associated with the purchase, use and disposal of goods and services, including the consumer's emotional, mental and behavioral responses that precede or follow these activities. Consumer behavior emerged in the 1940s and 50s as a distinct sub-discipline in the marketing area. In order to succeed in today's dynamic and rapidly evolving marketplace, marketers need to know everything about consumers - what they need, what they think, how they work, how they spend their money and time. They need to identify the influencing forces that affect consumer from psychology, sociology, anthropology, ethnography, marketing and economics, especially behavioral economics. It examines how emotions, attitudes and preferences affect buying behavior

Course Learning Objectives:

1. Provide an understanding of the needs and behaviours of consumers is an intrinsic component of the development
2. implementation of successful marketing actions.
3. Specific topics address the consumer decision process, internal and external influences on consumer behaviour4.Understand the roots of consumerism, consumer safety , consumer information and environmental concerns
5.Analyse consumer protection act 1986 , central consumer production council , state consumer protection councils and consumer deputes redressel forums

Course Outcomes:

1. Understanding consumers and market segments. Evolution of consumer behavior, consumer analysis and business strategy. Models of Buyer Behavior, Howard Model, Howard- Sheth Model and EKB Model
2. Infer Psychological Foundations of Consumer Behavior: Consumer Motivation, Perception, Personality and Behavior, Learning and Behavior Modification, Information Processing, Memory Organization and Function and Attitude Formation
3. Appreciate Communication and Consumer Behavior: Components of communications process, designing persuasive communication and Diffusion of Innovations. and Consumer Decision Processes
4. Analyze consumerism: The roots of consumerism, consumer safety, consumer information, environmental concerns, consumer privacy, legislative responses to consumerism and marketer responses to consumer issues.
5. Appreciate Consumer Protection: Consumer Protection Act 1986, Central consumer protection council, state consumer protection councils, consumer disputes redressal agencies, consumer disputes redressal forum

SYLLABUS

CONSUMER BEHAVIOR

UNIT- 1

Introduction to Consumer Behavior: Understanding consumers and market segments. Evolution of consumer behavior, consumer analysis and business strategy. Models of Buyer Behavior, Howard Model, Howard- Sheth Model, EKB Model, Webster and Wind Model and Sheth Industrial Buyer Behavior Model.

UNIT- 2

Psychological Foundations of Consumer Behavior: Consumer Motivation, Perception, Personality and Behavior, Learning and Behavior Modification, Information Processing, Memory Organization and Function, Attitude Formation and Attitude Change. Social and Cultural Environment Economic, Demographic, Cross Cultural and Socio–Cultural Influences, Social Stratification, Reference Groups and Family, Personal influence.

UNIT- 3

Communication and Consumer Behavior: Components of communications process, designing persuasive communication and Diffusion of Innovations. Consumer Decision Processes High and Low Involvement, Pre-purchase Processes, Post Purchase processes, Consumption and evaluation, Brand Loyalty and Repeat Purchase Behavior.

UNIT -4

Consumerism: The roots of consumerism, consumer safety, consumer information, environmental concerns, consumer privacy, legislative responses to consumerism and marketer responses to consumer issues.

UNIT- 5

Consumer Protection: Consumer Protection Act 1986, Central consumer protection council, state consumer protection councils, consumer disputes redressal agencies, consumer disputes redressal forum, National Consumer Disputes Redressal Commission.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Ramneek Kapoor, Nnamdi O Madichie: "Consumer Behavior" Text and Cases", TMH, New Delhi, 2012.
2. Ramanuj Majumdar: "Consumer Behavior insight from Indian Market", PHI Learning, New Delhi, 2011
3. M.S.Raju: "Consumer Behavior Concepts, applications and Cases", Vikas Publishing House, New Delhi, 2013.
4. David L Loudon and Albert J Della Bitta, "Consumer Behavior" 4/e, TMH, New Delhi, 2002.
5. Schiffman, L.G and Kanuk L.L "Consumer Behavior", 8/e, Pearson Education, New Delhi, 2003.

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Program Name: M.B.A Faculty Name: D.YEDUKONDALU

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	III	Business Ethics and Corporate governance	MB 1631	12-07-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
64	Theory 4	Practical ----	3 Hours	Internal 40	External 60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.

PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Business Ethics and Corporate governance is the mechanisms, processes and relations by which corporations are controlled and directed.[1] Governance structures and principles identify the distribution of rights and responsibilities among different participants in the corporation (such as the board of directors, managers, shareholders, creditors, auditors, regulators, and other stakeholders) and includes the rules and procedures for making decisions in corporate affairs. Corporate governance includes the processes through which corporations' objectives are set and pursued in the context of the social, regulatory and market environment. .

Course Outcomes:

1.Understand the values and ethics in work place,ethical decision making ,theories of business ethics and Indian ethical traditions

2 Appreciate reasons for unethical practices among Indian companies,development of Indian capital markets and major Indian scams

3.Infer Ethics in marketing ,HRM and Finance,advertising and target marketing,customer autonomy,HR related ethical issues and frauds in insurance sector

4.Analyze theory and practice of governance, Indian model of governance, land marks in emergence of OECB Princples, Sarbanes-Axle act 2002
5.Understand the role of government in ensuring corporate governance duties and responsibilities of auditors and role of media

Course Objectives:

1.This course focuses on key theoretical and practical approaches to business ethics

2. . CSR and corporate governance relevant to contemporary business environment

3. This course will develop your understanding of ethics at an individual and organizational level.

4. Highlights the importance of good governance in a range of organisational settings

5. Demonstrate an ability to write and debate about aspects of business ethics and corporate governance in a manner that is analytical, logical and critical

<u>SYALLABUS</u>

UNIT 1

Importance of Business Ethics: Values and Ethics- Business Ethics and Law – Ethics in Work Place – Ethical Decision Making- Theories of Business Ethics – Management and Ethics- Indian Ethical Traditions

UNIT 2

Impact of Globalization on Indian Business Ethics: Reasons for Unethical Practices among Indian companies – Development of Indian Capital Markets – Various studies on Ethical Attitudes of Managers Major Indian Scams

UNIT 3

Ethics in Marketing, HRM and Finance: Product safety and Pricing-Ethical responsibility in Product- Advertising and Target Marketing Ethics of sales, advertising and product placement and Consumer Autonomy.Ethics in HRM & Finance – HR related ethical issues - Institutional Culture – Frauds in Banks - Measures against Bank Frauds – Frauds in Insurance sector

UNIT 4

Corporate Governance: An overview – Theory and Practice of Governance- Indian model of Governance - Good Corporate Governance – Land marks in emergence of Governance OECB Principles – Sarbanes-Oxley Act 2002- SEBI Initiatives

UNIT 5

Corporate Governance Indian Scenario: Role of Government in Ensuring Corporate Governance – Governance issues relating to Board of Directors – Duties and responsibilities of Auditors – Governance under limited competition – Role of Media – Corporate Governance in Developing and Transiting Economies.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. S.K.Mandal: "Ethics in Business and Corporate Governance", TMH, New Delhi, 2012.
2. Marianne M Jennings: "Cases in Business Ethics", Cengage Learning, New Delhi, 2012.
3. S.Prabhakaran: "Business Ethics and Corporate Governance", Excel Books, New Delhi, 2011.
4. N.Balasubramanyam: "A Case Book on Corporate Governance and Stewardship", TMH., New Delhi, 2011.
5. A.C.Fernando: "Business Ethics and Corporate Governance", Pearson Publishers, New Delhi, 2013.

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Program Name: M.B.A Faculty Name: U.CHANDRAMOULI

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	III	Legal Aspects of business	MB 1636	12-07-2018

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
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	situations.
PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Legal Aspects consists of many different areas taught in law school and business school curricula, including: Contracts, the law of Corporations and other Business Organizations, Securities Law, Intellectual Property, Antitrust, Secured Transactions, Commercial Paper, Income Tax, Pensions & Benefits, Trusts & Estates, Immigration Law, Labor Law, Employment Law and Bankruptcy. It is a branch of law that examines topics that impact the operation of a business.

Course Outcomes:

1.Infer the Indian contracts act 1872 and classification of contracts,essentials of valid contract , free consent, discharge of a contract and breach of contracts

2.Analyze the distinction between sales and agreement to sell, conditions and warranties, performance of contract of sale,right o f unpaid seller, consumer protection 1986 and information technology act 2000
3.Understand the kinds of agents, creation of agency, duties and rights of principal and agents, negotiable instrument act 1881 and presentation and discharge of negotiable instrument
4.Infer the meaning and essentials of partnership, tests of partnership, duties and rights of the partners and dissolution of partnership
5.Analyze the nature and types of companies,memorandum of association, articles of association, kinds of shares and winding up

Course Objectives:

1. To provide basic understanding of law of contract, Law of agency, Bailment & Pledge
2. To provide basic requirements of Negotiable Instruments Act, Law of Insurance and Law of Partnership for the purpose of conducting business.
3. To impart basic provisions of Companies Act concerning incorporation and regulation of business organizations
4. To create an awareness about important legislations namely Sale of Goods Act, Consumer Protection Act, Factories Act having impact on business
5. To appraise the students on the leading practical application oriented case studies – relevant and updated and analyzing case laws in arriving at conclusions facilitating business decisions

SYLLABUS

UNIT 1

Importance of Commercial Law: The Indian Contracts Act, 1872 – Nature of the Act and Classification of Contracts – Essentials of a Valid Contract – Offer and Acceptance – Capacity – Consideration –Free Consent –Legality of Object –Performance of a Contract – Discharge of a Contract – Breach of a Contract and Remedies.

UNIT 2

Sales of Goods Act: Distinction between Sales and Agreement to Sell – Conditions and Warranties – Performance of Contract of Sale –Transfer of Ownership – Rights of an Unpaid Seller. Consumer Protection Act, 1986: Consumer Right –Machinery for Redressal of Consumer Grievances.- Information Technology Act 2000.

UNIT 3

Contract of Agency: Kinds of Agents –Creation of Agency- Duties and Rights of Principal and Agents- Principal's Liability for the Acts of the Agent-Liability of Agent –Termination of

Agency. Negotiable Instruments Act, 1881- Kinds of a Negotiable Instruments and endorsement-Presentation and discharge of Negotiable Instrument.

UNIT 4

Indian Partnership Act, 1932: Meaning and Essentials of Partnership- Registration – Tests of Partnership-Duties and Rights of Partners – Dissolution of Partnership.

UNIT 5

Company Act 1956: Nature and Types of Companies – Formation – Memorandum of Association-Articles of Association –Kinds of Shares –Duties of Directors-Winding up.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Ravindra Kumar: “Legal Aspects of Business”, Cengage Learning, New Delhi, 2011

2. Kuchhal M C, Deepa Prakash: “Business Legislation for Management”, Vikas Publishing House, New Delhi, 2012

3. Pathak: “Legal Aspects of Business”, Tata McGraw Hill, New Delhi, 2010

4. S.N.Maheshwari, S.K.Maheshwari: “A Manual of Business Laws”, Himalaya Publishing House, 2013.

5 P.K.Padhi: “Legal Aspects of Business”, PHI Learnings, New Delhi, 2013

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Program Name: M.B.A Faculty Name: L.PRATHIBA REDDY

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	III	STRATEGIC MANAMANET	MB 1636	12-07-2018

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
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PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.
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Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
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Course Context and Overview:

STRATEGIC MANAMANET of many different areas taught in law school and business school curricula, including: Contracts, the law of Corporations and other Business Organizations, Securities Law, Intellectual Property, Antitrust, Secured Transactions, Commercial Paper, Income Tax, Pensions & Benefits, Trusts & Estates, Immigration Law, Labor Law, Employment Law and Bankruptcy. It is a branch of law that examines topics that impact the operation of a business.

Course Outcomes:

1.Infer the Indian contracts act 1872 and classification of contracts,essentials of valid contract , free consent, discharge of a contract and breach of contracts
2.Analyze the distinction between sales and agreement to sell, conditions and warranties, performance of contract of sale,right o f unpaid seller, consumer protection 1986 and information technology act 2000
3.Understand the kinds of agents, creation of agency, duties and rights of principal and agents, negotiable instrument act 1881 and presentation and discharge of negotiable instrument
4.Infer the meaning and essentials of partnership, tests of partnership, duties and rights of the partners and dissolution of partnership
5.Analyze the nature and types of companies,memorandum of association, articles of association, kinds of shares and winding up

Course Objectives:

1. To provide basic understanding of law of contract, Law of agency, Bailment & Pledge
2. To provide basic requirements of Negotiable Instruments Act, Law of Insurance and Law of Partnership for the purpose of conducting business.
3. To impart basic provisions of Companies Act concerning incorporation and regulation of business organizations
4. To create an awareness about important legislations namely Sale of Goods Act, Consumer Protection Act, Factories Act having impact on business
5. To appraise the students on the leading practical application oriented case studies – relevant and updated and analyzing case laws in arriving at conclusions facilitating business decisions

SYLLABUS

UNIT 1

Importance of Commercial Law: The Indian Contracts Act, 1872 – Nature of the Act and Classification of Contracts – Essentials of a Valid Contract – Offer and Acceptance – Capacity – Consideration –Free Consent –Legality of Object –Performance of a Contract – Discharge of a Contract – Breach of a Contract and Remedies.

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Program Name: M.B.A Faculty Name: T.SHYAMALA

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	III	CUSTOMER RELATIONSHIP MANAGEMENT	MB 1639	12-07-2018

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
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PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Customer-relationship management (CRM) is an approach to manage a company's interaction with current and potential customers. It uses data analysis about customers' history with a company to improve business relationships with customers, specifically focusing on customer retention and ultimately driving sales growth. One important aspect of the CRM approach is the systems of CRM that compile data from a range of different communication channels, including a company's website, telephone, email, live chat, marketing materials and more recently, social media. Through the CRM approach and the systems used to facilitate it, businesses learn more about their target audiences and how to best cater to their needs.

1. .

Course Outcomes:

1. Analyze the elements of CRM ,CRM Processes and systems, Importance of CRM, Critical success factors for a winning CRM program – Advantages of CRM – Integrated CRM system ,Planning and Managing CRM Programme and Application areas.

2. Infer the CRM as an integrated business strategy: Nature of CRM strategy – Contents of CRM Strategy ,Description of Customer – Supplier Relationships, The dynamics of Relationships, and the relationship oriented organization
3. Understand CRM marketing aspects: Customer knowledge, value of customer knowledge, utilization of data as an asset, multi-channels and communication- Influence of the channels on pricing and the formation of relationships
4. Appreciate the analytical CRM: Relationship data management – Expanding the size of customer database -Data analysis and data mining – Concept of customer loyalty – customer value assessment – Customer Retention strategies
5. Analyze the Operational CRM and CRM implementation: Call center Management – internet and the websites – traffic building – Providing quality during the visit to the website and Process of developing producing, sending and following

Course Objectives:

1. 1.Develop understanding about customer relationship management concepts and frameworks
2. How the concepts are applied to form relationships with customers and other internal and external stakeholders.
3. Develop skills to analyse and synthesise information and issues, related to customer relationship management, from several perspectives.
4. Enhance business communication skills required to work effectively within a marketing team
   Enhance the knowledge of students in customer relationship management

SYLLABUS

UNIT 1

Introduction: Definition of CRM –Elements of CRM – CRM Processes and systems, Importance of CRM, Critical success factors for a winning CRM program – Advantages of CRM – Integrated CRM system –Planning and Managing CRM Programme - Application areas.

UNIT 2

CRM as an integrated business strategy: Nature of CRM strategy – Contents of CRM Strategy – Description of Customer – Supplier Relationships, The dynamics of Relationships, The relationship oriented organization.

UNIT 3

CRM marketing aspects: Customer knowledge, value of customer knowledge, utilization of data as an asset, multi-channels and communication- Influence of the channels on pricing and the formation of relationships – The relationship policy to improve size, quality and relationship with the customer base.

UNIT 4

Analytical CRM: Relationship data management – Expanding the size of customer database -Data analysis and data mining – Concept of customer loyalty – customer value assessment – Customer Retention strategies – Retention and Cross – sell analyses – effect of marketing activities – Reporting the results

UNIT 5

Operational CRM and CRM implementation: Call center Management – internet and the websites – traffic building – Providing quality during the visit to the website – Process of developing, producing, sending and following – up direct mailings. Causes for disappointing CRM results – The best CRM implementation strategies –Privacy and ethics Consideration in CRM implementation.

References:

1. Ed Peelen: "Customer Relationship Management" Pearson, Education

2. Roger J Baran, Robert J Galka and Daniel P Strunk: "Customer Relationship Management" Cengage learning

3. S.Shanmuga sundaram: "Customer Relationship Management" Prentice Hall of India.

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Program Name: M.B.A Faculty Name:

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	I	Compensation management	MB 1632	12-07-2018

SYLLABUS

<table>
<tr><th>Total No.of Hours for Teaching-Learning</th><th colspan="2">Instructional Hours for Week</th><th>Duration of semester End Examination in Hours</th><th colspan="2">Max Marks</th><th>Credits</th></tr>
<tr><td rowspan="2">64</td><td>Theory</td><td>Practical</td><td rowspan="2">3 Hours</td><td>Internal</td><td>External</td><td rowspan="2">2</td></tr>
<tr><td>4</td><td>----</td><td>40</td><td>60</td></tr>
</table>

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.

PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Compensation management is a strategic matter. Compensation would include rewards when you offer monetary payment such as incentives, various bonuses and performance bonus. Organizations reward their staff when they attain the goals or targets that they have jointly set with the employees. Rewards can be non-monetary such as a paid vacation for two. When we mention about compensation, we would refer to a salary scale for different levels. Generally, we would classify the salary scale into non-executive, executive and managerial before the salary range is established. Next, you may ask whether compensation is a hygiene factor or a motivational factor. We would consider it a hygiene factor when the salary paid out on the monthly basis is fixed.

Course Outcomes:

1. Analyse the concept and definition – objectives and dimensions of compensation program – factors influencing compensation –Role of compensation and Reward in Modern organizations-Compensation as a Retention strategy and aligning compensation strategy

2. Infer Job evaluation and Compensation Structure: Introduction to Principles and Procedures of job evaluation programs-Introduction to basic job evaluation methods-Compensation Structure-History and past practices, elements of ,management compensation and Types of compensation system.
3. Understand Wage and Salary administration: Nature and Purpose, Wage surveys-Administration of wage and salary-Principles-Components of wages-Theory of wages-Wage differentials-Importance-Wage differentials in India andExecutive compensation plans
4. Appreciate Control systems for labour costs: Introduction-Direct and Indirect labour , Role of various departments-The personnel department-Industrial engineering department and Types of worker-Payroll department
5. Analyze Pay Structure and Tax Planning: Introduction- Compensation Structures-Performance based and Pay based structures-Designing pay structures-comparison in evaluation of different types of pay structures and Significance of factors affecting,Tax Planning

Course Objectives:

1.To learn basic compensation concepts and the context of compensation practice
2. To illustrate different ways to strengthen the pay-for-performance link.
3. To learn the concepts of Payment and employee benefits issues for contingent workers.
4. To understand the legally required employee benefits.
5. To learn some of the implications for strategic compensation and possible employer approaches to managing legally required benefits

SYLLABUS

Course Content :

UNIT 1

Compensation: concept and definition – objectives and dimensions of compensation program – factors influencing compensation –Role of compensation and Reward in Modern organizations-Compensation as a Retention strategy- aligning compensation strategy with business strategy – concept of reward - non-financial compensation system-Reward management process -Managing Compensation: Designing a compensation system – internal and external equity– pay determinants - frame work of compensation policy - influence of pay on employee attitude and behavior - the new trends in compensation management at national and international level.

UNIT 2

Job evaluation and Compensation Structure: Introduction to Principles and Procedures of job evaluation programs-Introduction to basic job evaluation methods-Compensation Structure-History and past practices, elements of ,management compensation –Types of compensation system, Role of compensation and Reward in modern organizations-compensation surveys-Incentive payments and its objectives.

UNIT 3

Wage and Salary administration: Nature and Purpose, Wage surveys-Administration of wage and salary-Principles-Components of wages-Theory of wages-Wage differentials-Importance-Wage differentials in India-Executive compensation plans-Legal frame work for wage and salary administration.

UNIT 4

Control systems for labour costs: Introduction-Direct and Indirect labour , Role of various departments-The personnel department-Industrial engineering department-Types of worker-Payroll department-Process and steps for preparation of payroll-Wage analysis-Cost accounting treatment of wages components-Compensation surveys-Profit sharing.

UNIT 5

Pay Structure and Tax Planning: Introduction- Compensation Structures-Performance based and Pay based structures-Designing pay structures-comparison in evaluation of different types of pay structures-Significance of factors affecting-Tax Planning –Concept of Tax planning-Role of tax planning in compensation benefits-Tax efficient compensation package-Fixation of tax liability salary restructuring.

Dr. Kanchan Bhatia "Compensation Management", Himalaya Publishing House, New Delhi 2012.

2. A.M.Sarma, N.Sambasiva Rao: "Compensation and Performance management", Himalaya Publishing House, Mumbai

3. Dewakar Goel:"Performance Appraisal and Compensation Management", PHI Learning, New Delhi, 2012

4. ER Soni Shyan Singh 'Compensation Management' – Excel Books, New Delhi – 2008

Mousumi S Bhattacharya Nilanjan Sengupta , "Compensation Management" – Excel Books, New Delhi – 2009

6. Tapomoy Deb "Compensation Management" – Excel Books, New Delhi – 2009

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Program Name: M.B.A Faculty Name: L.PRATHIBAREDDY

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	III	Leadership management	MB 1633	12-07-2018

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
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PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Leadership management is both a research area and a practical skill encompassing the ability of an individual or organization to "lead" or guide other individuals, teams, or entire organizations Specialist literature debates various viewpoints, contrasting Eastern and Western approaches to leadership, and also (within the West) United States versus European approaches. U.S. academic environments define leadership as "a process of social influence in which a person can enlist the aid and support of others in the accomplishment of a common task

Course Outcomes:

1. Analyze the evolution Components and evaluation of leadership,factors of leadership,Situational Leadership Behaviour: Meaning, Fiedler Contingency Model, Path Goal and Normative Models and Emerging Leadership Behaviour:
2. Infer Similarities and Distinctions of Need Hierarchy and Two Factors theories. ERG – McClelland - Expectancy - Porter and Lawler Theories.and Emerging Challenges in Motivating Employees

3. Understand Leadership development: Significance – Continuous Learning: Principles of learning to develop effective leadership – Vision and Goals for organisation: significance of goals for leaders and Charting vision and goals of Indian leaders and abroad
4. Appreciate Interpersonal Leadership Skills: Praise – Criticise – Communicate – Leadership Assertiveness: Circle of influence and circle of concern – Leadership with Edification
5. Analyze Leadership across Globe: Characteristics - Significance – Functions – GLOBE research program of Wharton School – challenges of

leadership in varying culture and values – Global perspectives of leadership – Leadership in USA – Leadership in Japan – European leadership and Leadership in Arab countries

Course Objectives:

1 Students will develop critical thinking skills about leadership and path goal theories.

2. Students will develop an understanding of change processes and be able to think critically about obstacles to change.

3. Students will understand and be able to use a process for decision making.

4. Students will understand the history of leadership and current leadership theories. In addition, students will understand how leadership models are put into practice personally, locally, and globally.

5. Students will gain knowledge of diverse cultures, cross-cultural communication, the dynamics of privilege and oppression, and the uses of power between groups.

Course Content :

LEADERSHIP MANAGEMENT

Unit 1:

Organisational Leadership: Definition,Components and evaluation of leadership,factors of leadership,Situational Leadership Behaviour: Meaning, Fiedler Contingency Model, Path Goal and Normative Models - Emerging Leadership Behaviour: Transformational, Transactional and Visionary Leadership - Leadership for the new Millennium Organisations - Leadership in Indian Organisations. Leadership Effectiveness: Meaning, Reddins' 3-D Model, Hersey and Blanchard Situational Model, Driving Leadership Effectiveness, Leadership for Organisational Building.

LUenaitd 2er: s h ip Motivation, Culture: Motivation Theories for Leadership: Maslow's, Herzberg, X,

Y and Z theories of Motivation - Similarities and Distinctions of Need Hierarchy and Two Factors theories. ERG – McClelland - Expectancy - Porter and Lawler Theories. - Emerging Challenges in Motivating Employees. Motivation,Satisfaction,Performance.Organisational Culture: Meaning, Definitions, Significance, Dimensions, Managing Organisational Culture, Changing organisational Cultural.

Unit 3:

Leadership Development: Leadership development: Significance – Continuous Learning: Principles of learning to develop effective leadership – Vision and Goals for organisation: significance of goals for leaders – Charting vision and goals of Indian leaders and abroad - Tools for developing dreams for effective leadership dreams – Leaders vision in organisation building – Leadership Attitude: significance – Developing and Maintaining positive attitude for effective leading.

Unit 4:

Strategic Leadership: Leader Self management: significance - Developing self esteem and balancing emotions – Interpersonal Leadership Skills: Praise – Criticise – Communicate – Leadership Assertiveness: Circle of influence and circle of concern – Leadership with Edification: Tools of edification – Leadership and creativity: Developing creative thinking – Leadership and Team Building: Principles of team building, individual versus Group versus

Teams – Leadership and Integrity: Developing character and values.
LUenaitd 5er: s hip in the cross cultural context: Leadership across Globe: Characteristics - Significance – Functions – GLOBE research program of Wharton School – challenges of leadership in varying culture and values – Global perspectives of leadership – Leadership in USA – Leadership in Japan – European leadership – Leadership in Arab countries – Implications of global leadership – Leadership and Corporate Social Responsibility across globe.
Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

Reference Books:

1. Peter G. Northouse, Leadership, 2010, Sage. Publication.
2. Richard L. Daft "Leadership" Cengage Learning 2005.
3. Uday Kumar Haldar "Leadership and Team Building" Oxford Higher Education 2010
4. Richard L Hughes, Robert C Ginnett, Gordon J Curphy "Leadrship" Tata Mc Graw Hill Education Private Limited 2012.
5. Peter Lornge, Thought leadership Meets Business, 1st edition, 2009, Cambridge.
6. John ADAIR, Inspiring Leadership, 2008, Viva Books.
4. Subba Rao P: "***Personnel and Human Resource Management-Text and Cases***", Himalaya Publications, Mumbai, 2013.
5. Madhurima Lall, Sakina Qasim Zasidi: "**Human Resource Management**", Excel Books, New Delhi, 2010

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Program Name: M.B.A Faculty Name J.NAVEEN GUPTA

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	III	Performance management	MB 1634	12-07-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
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PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.

PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Performance management is an ongoing process of communication between a supervisor and an employee that occurs throughout the year, in support of accomplishing the strategic objectives of the organization. The communication process includes clarifying expectations, setting objectives, identifying goals, providing feedback, and reviewing results. Overseeing performance and providing feedback is not an isolated event, focused in an annual performance review. It is an ongoing process that takes place throughout the year. The Performance Management process is a cycle, with discussions varying year-to-year based on changing objectives. Goals and objectives are discussed throughout the year, during check-in meetings. This provides a framework to ensure employees achieve results through coaching and mutual feedback.

Course Outcomes:

1. Analyse concerns-scope-Historical developments in performance management-Over view of performance management-Process for managing performance-Importance – Linkage of PM to other HR processes.

2. Infer Performance Management Planning: Introduction-Need-Importance-Approaches,the Planning Process Planning Individual Performance- Strategic Plannin,Linkages to strategic planning and Barriers to performance planning
3. Appreciate Management System: objective ,Functions- Phases of Performance Management System- Competency based Performance Management Systems- Reward based Performance Management Systems and Electronic Performance Management Systems
4. Evaluate Performance Monitoring and Counseling Supervision ,Objectives and Principles of Monitoring,Monitoring Process- Periodic reviews Problem solving-engendering trust-Role efficiency and Coaching
5. Appreciate Performance management skills – Operational change through performance management. High Performing Teams: Building and leading High performing teams, team oriented organizations – developing and leading high performing teams

Course Objectives:

1. 1.Describe the nature of performance management and outline the core objectives of performance management
2. Outline the performance management cycle and identify and explain the key stages of this cycle
3. Differentiate between performance management and performance appraisal
4. Identify the different performance appraisal techniques that can be used by organisations
5. Evaluate the advantages and disadvantages of different performance appraisal techniques

SYLLABUS

Unit-1
Introduction: –Definition –concerns-scope-Historical developments in performance management-Over view of performance management-Process for managing performance-Importance –Linkage of PM to other HR processes-Performance Audit.

Unit-2
Performance Management Planning: Introduction-Need-Importance-Approaches-The Planning Process—Planning Individual Performance- Strategic Planning –Linkages to strategic planning-Barriers to performance planning-Competency Mapping-steps-Methods.

Unit-3
Management System: objectives – Functions- Phases of Performance Management System- Competency based Performance Management Systems- Reward based Performance Management Systems- Electronic Performance Management Systems- HR Challenges-Appraisal for recognistion and reward-Purpose of

Appraising –Methods of Appraising-Appraisal system design-Implementing the Appraisal System-Appraisal and HR decisions.

Unit-4

Performance Monitoring and Counseling: Supervision- Objectives and Principles of Monitoring- Monitoring Process- Periodic reviews- Problem solving- engendering trust-Role efficiency- Coaching- Counseling and Monitoring- Concepts and Skills

Unit-5

Performance management skills – Operational change through performance management. High Performing Teams: Building and leading High performing teams – team oriented organizations – developing and leading high performing teams- Role of LeadershipRelevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Prem Chadha: "Performance Management", Macmillan India, New Delhi, 2008.
2. Michael Armstrong & Angela Baron, "Performance Management": The New Realities, Jaico Publishing House, New Delhi, 2010.
3. T.V.Rao, "Appraising and Developing Managerial Performance", Excel Books, 2003. 4. David Wade and Ronad Recardo, "Corporate Performance Management", Butter Heinemann, New Delhi, 2002.
5. Dewakar Goel: "Performance Appraisal and Compensation Management", PHI Leaarning, New Delhi, 2009
6. A.M. Sarma "Performance Management Systems" Himalaya Publishing House, New Delhi, 2010.

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Program Name: M.B.A   Faculty Name: M.KUMARASWAMY

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	III	RETAIL MANAGEMENT	MB 1639	12-07-2018

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
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Course Context and Overview:

Retail is the process of selling consumer goods or services to customers through multiple channels of distribution to earn a profit. Retailers satisfy demand identified through a supply chain. The term "retailer" is typically applied where a service provider fills the small orders of a large number of individuals, who are end-users, rather than large orders of a small number of wholesale, corporate or government clientele. Shopping generally refers to the act of buying products. Sometimes this is done to obtain final goods, including necessities such as food and clothing; sometimes it takes place as a recreational activity. Recreational shopping often involves window shopping and browsing: it does not always result in a purchase. Retail markets and shops have a very ancient history, dating back to antiquity. Some of the earliest retailers were itinerant peddlers

Course Outcomes:

1. Analyze the Retail development ,types and functions of retailers ,multi channel retailing ,organized retailing in India – special characteristics of retailing services retailing- legislation for retailing in India
2. Infer the Retail strategy: market strategy ,retail format and target market , building sustainable competitive advantage – growth strategies and strategic retail planning process
3. Appreciate the Retail location, Types, location opportunities – selection of location and Site analysis -financial strategy ,strategic profit model , setting and measuring and performance objectives

.

4. Understand the Store layout and design: Store operations and inventory management- Merchandise planning and control - Buying merchandise and developing Assortment plan
5. Analyze the Retail Pricing Strategy:, Category Management, Customer services ,Retail branding -International retailing ,Promotional strategies ,advertising, sales promotion, and Store atmosphere

Course Objectives:

1. Understand the impact of retailing on the economy
2. .Comprehend retailing's role in society and, conversely, society's impact on retailing.
3. See how retailing fits within the broader disciplines of business and marketing..
4. Recognize and understand the operations-oriented policies, methods, and procedures used by successful retailers in today's global economy.
5. Know the responsibilities of retail personnel in the numerous career positions available in the retail field.

SYALLABUS

Course Content :

UNIT 1

Basic concept of retailing: Retail development – types and functions of retailers – multi channel retailing – organized retailing in India – special characteristics of retailing services retailing- legislation for retailing in India.

UNIT 2

Retail strategy: market strategy – retail format and target market – building sustainable competitive advantage – growth strategies – strategic retail planning process.

UNIT 3

Retail location – Types, location opportunities – selection of location and Site analysis -financial strategy – strategic profit model – setting and measuring performance objectives.

UNIT 4

Store layout and design: Store operations and inventory management- Merchandise planning and control - Buying merchandise – Developing Assortment plan.

UNIT 5

Retail Pricing Strategy:, Category Management, Customer services – Retail branding - International retailing – Promotional strategies – advertising, sales promotion, Store atmosphere.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Sheikh and Kaneez Fatima, "Retail Management", Himalaya Publishing House, Mumbai, 2012
2. A.J. Lamba:"The Art of Retailing", Tata McGraw Hill Education Pvt. Ltd. New Delhi.2011
3. Sivakumar, A, "Retail Marketing", Excel Books, New Delhi, 2007
4. Swapna Pradhan, "Retail management", Tata McGraw Hill Education Pvt. Ltd. New Delhi, 2012
5. Berman Barry, Joel R. Evans and Mini Mathur, "Retail Management-A Strategic Approach", Pearson Education, New Delhi, 2011.
6. Chetan Bajaj RajnishTuli, Nidhivarma Srivastava:"Retail Management", Oxford University Press, New Delhi, 2012.

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Program Name: M.B.A Faculty Name: S.Praveen

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	III	Security analysis portifoliomanagement	MB 1638	12-07-2018

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world

	situations.
PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Security analysis is the analysis of financial Tradable instruments called securities. It deals with finding the proper value of individual securities (i.e., stocks and bonds). These are usually classified into debt securities, equities, or some hybrid of the two. Tradable credit derivatives are also securities. The term "portfolio" refers to any combination of financial assets such as stocks, bonds and cash. Portfolios may be held by individual investors and/or managed by financial professionals, hedge funds, banks and other financial institutions. It is a generally accepted principle that a portfolio is designed according to the investor's risk tolerance, time frame and investment objectives.

Course Outcomes:

1. Analyze Concept of Investment Education: Investment Vs Speculation, Investment alternatives -Investment Process - Sources of Investment Information – Trading System in Stock Exchanges –Market Indices and Calculation of SENSEX and NIFTY.
2. Infer Equity and Bond Valuation Models – Preference Shares and Equity Shares Earning valuation-Cash flow valuation-Asset Valuation-Dividend-discount model; Valuation of Bonds – Bond Returns and Risks -Bond Pricing Theorems convexity, duration and bond immunization
3. Understand Investment Analysis: Fundamental Analysis – Economy, Industry and Company Analysis, Technical Analysis – Dow Theory – Elliot Wave Theory – Trends and Trend Reversals and Efficient Market Theory.
4. Appreciate Portfolio Analysis and Selection: Elements of Portfolio Management, Portfolio Models – Markowitz Model, Efficient Frontier and Selection of Optimal Portfolio. Sharpe Single Index Model and Capital Asset Pricing Model
5. Analyse Portfolio Evaluation and Revision: Performance Evaluation of Portfolios; Sharpe Model – Jensen's Model for PF Evaluation, Evaluation of Mutual Fund – Portfolio Revision

Course Objectives:

1. To acquaint the students with the fundamentals principles of basic investment decisions.
2. To acquaint the students bond portfolio management strategies and analyzing and valuation on common stock.
3. To acquaint the students Understand portfolio concept and valuation and investment theories.
4. To enable the student Understand portfolio concept and valuation of theories.
5. To enable the student Performance Evaluation of Portfolios and Sharpe's Performance Index.

Course Objectives:

1. To acquaint the students with the fundamentals principles of basic investment decisions.
2. To acquaint the students bond portfolio management strategies and analyzing and valuation on common stock.
3. To acquaint the students Understand portfolio concept and valuation and investment theories.
4. To enable the student Understand portfolio concept and valuation of theories.
5. To enable the student Performance Evaluation of Portfolios and Sharpe's Performance Index.

SYLLABUS

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Unit-I:

Concept of Investment Education: Investment Vs Speculation, Investment alternatives -Investment Process - Sources of Investment Information – Trading System in Stock Exchanges –Market Indices. Calculation of SENSEX and NIFTY - Return and Risk – Meaning and Measurement of Security Returns. Meaning and Types of Security Risks: Systematic Vs Non-systematic Risk - Measurement of Risk. (Problems)

Unit-II:
Equity and Bond Valuation Models – Preference Shares and Equity Shares Earning valuation-Cash flow valuation-Asset Valuation-Dividend-discount model; Valuation of Bonds – Bond Returns and Risks -Bond Pricing Theorems convexity, duration, bond immunization. (Problems)

Unit-III:
Investment Analysis: Fundamental Analysis – Economy, Industry and Company Analysis, Technical Analysis – Dow Theory – Elliot Wave Theory – Trends and Trend Reversals -Efficient Market Theory –Hypothesis- Forms of Market Efficiency.

Unit-IV:
Portfolio Analysis and Selection: Elements of Portfolio Management, Portfolio Models – Markowitz Model, Efficient Frontier and Selection of Optimal Portfolio. Sharpe Single Index Model and Capital Asset Pricing Model, Arbitrage Pricing Theory. (Problems)

Unit-V:
Portfolio Evaluation and Revision: Performance Evaluation of Portfolios; Sharpe Model – Jensen's Model for PF Evaluation, Evaluation of Mutual Fund – Portfolio Revision. (Problems)

References

1. S.Kevin: "Security Analysis and Portfolio Management", PHI Learning, New Delhi, 2009 2. Punithavathy Pandian: "Security Analysis and Portfolio Management", Vikas Publishing House, New Delhi, 2009
2. . Sudhendra Bhat: "Security Analysis and Portfolio Management", Excel Books, New Delhi, 2009.
3. 4. Shashi K Gupta: "Security Analysis and Portfolio Management", Kalyani Publishers, New Delhi,2010

4. 5. Prasanna Chandra, "Investment Analysis and Portfolio Management", 3/e Tata McGraw-Hill Publishing Co. Ltd. New Delhi, 2003.
5. 6. Ranganatham : "Investment Analysis and Portfolio Management" Pearson Education.

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Program Name: M.B.A Faculty Name: M.KMARASWAMY

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	I	Strategic financial management	MB 1637	12-07-2018

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
64	Theory 4	Practical ----	3 Hours	Internal 40	External 60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world

	situations.
PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Strategic financial management is the study of finance with a long term view considering the strategic goals of the enterprise. Financial management is nowadays increasingly referred to as "Strategic Financial Management" so as to give it an increased frame of reference. To understand what strategic financial management is about, we must first understand what is meant by the term "Strategic". Which is something that is done as part of a plan that is meant to achieve a particular purpose? Therefore, Strategic Financial Management are those aspect of the overall plan of the organization that concerns financial managers. This includes different parts of the business plan, for example marketing and sales plan, production plan, personnel plan, capital expenditure, etc. These all have financial implications for the financial managers of an organization.

Course Outcomes:

1. Analyze Strategic Financial Planning- changing complexion of regulatory framework, Shareholder Value Creation (SCV): Market Value Added (MVA) ,Market-to-Book Value (M/BV) – Economic Value Added (EVA)
2. Infer Corporate Financial Strategies: Capital Structure Planning- EBIT,EPS,ROE analysis-Shareholders' Risk — Financial Options and Value of the Firm – Dividend Policy and Value of the Firm .
3. Understand the Marginal Costing: Cost Concepts for Decision making – Decision Making Process, Decision Situations-Sales Volume Decisions, Pricing and Special Order Pricing Make or Buy Decisions, Product Decisions- Addition and Deletion and Alteration of Mix.
4. Infer Corporate Investment Strategy: Techniques of Investment Appraisal Under Risk and Uncertainty, Risk Adjusted Net Present Value, Risk Adjusted Internal Rate of Return, Capital Rationing and Decision Tree Approach.
5. Appreciate Corporate Restructuring: Takeover Strategy ,Types of Takeovers – Negotiated and Hostile Bids , Takeover Procedure, Takeover Defenses – Takeover Regulations of SEBI – Distress Restructuring Strategies and Sell offs.

Course Objectives:

1. To explain and evaluate arguments for adopting shareholder wealth maximization as the primary objective of a private-sector company and calculate the achievement of this through a range of complementary methods
2. . To explain, evaluate and apply methods of implementing value-based management in the internal management of companies and divisions
3. To evaluate and appraise the working capital management practices of organizations
4. To critically evaluate the Capital Asset Pricing Model in comparison with alternative approaches.
5. To explain and critically evaluate dividend theory and the impact of dividend policies on shareholder wealth.

SYLLABUS

Unit-I:
Corporate Policy: Strategic Financial Planning- changing complexion of regulatory framework - Shareholder Value Creation (SCV): Market Value Added (MVA) – Market-to-Book Value (M/BV) – Economic Value Added (EVA) – Managerial Implications of Shareholder Value Creation- Corporate Risk Management – Understanding the firms Strategic Exposure.

Unit-II:
Corporate Financial Strategies: Capital Structure Planning- EBIT,EPS,ROE analysis-Shareholders' Risk — Financial Options and Value of the Firm – Dividend

Policy and Value of the Firm – Growth and External Financing Requirement. (Problems)

Unit-III:
Corporate Investment Strategy: Techniques of Investment Appraisal Under Risk and Uncertainty – Risk Adjusted Net Present Value – Risk Adjusted Internal Rate of Return – Capital Rationing – Decision Tree Approach for Investment Decisions – Evaluation of Lease Vs Borrowing Decision- Long term investment plans analysis with risk and return. (Problems)

Unit-IV:
Corporate Financial Engineering: Merger Strategy – Theories of Mergers – Horizontal and Conglomerate Mergers – Merger Procedure – Valuation of Firm – Financial Impact of Merger – Merge and Dilution Effect on Earnings Per Share – Merger and Dilution Effect on Business Control. (Problems)

Unit-V:
Corporate Restructuring: Takeover Strategy – Types of Takeovers – Negotiated and Hostile Bids – Takeover Procedure – Takeover Defenses – Takeover Regulations of SEBI – Distress Restructuring Strategy – Sell offs – Spin Offs – Leveraged Buyouts- Buy back shares – Alignment of Interest – Corporate Governance . (Problems)

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Coper and Weston: “Financial Theory and Corporate Policy”
2. Braley and Myers: “The Principles of Corporate Finance”. Mc.Graw Hill, N.Y.1993. 3. Prasanna Chandra : “Financial Management” Theory and Practice.
4. I.M. Pandey – “Financial Management” Vikas Publishers, New Delhi.

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Program Name: M.B.A Faculty Name: S.Praveen

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	III	Strategic human resource management	MB 1635	12-07-2018

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams.

	This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.
PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Strategic human resource management is the practice of attracting, developing, rewarding, and retaining employees for the benefit of both the employees as individuals and the organization as a whole. HR departments that practice strategic human resource management do not work independently within a silo; they interact with other departments within an organization in order to understand their goals and then create strategies that align with those objectives, as well as those of the organization. As a result, the goals of a human resource department reflect and support the goals of the rest of the organization. Strategic HRM is seen as a partner in organizational success, as opposed to a necessity for legal compliance or compensation. Strategic HRM utilizes the talent and opportunity within the human resources department to make other departments stronger and more effective.

Course Outcomes:

1. Evaluate objectives and Importance of Human Resources Strategy- Strategic fit – Aconceptual framework -Human Resources contribution to strategy - Strategy driven role behaviors and practices – Theoretical Perspectives on SHRM and approaches
2. Infer Human Resource Planning: Objectives, benefits, levels of strategic planning-Activities related to strategic HR Planning-Basic overview of various
3. Appreciate strategic planning models and Strategic HR Planning model implementation as a social issue-The role of Human Resource-Work force utilization and employment practices-Resourcing and Retention strategies
4. Analyze Strategic Human Resource Development: Concept of Strategic Planning for HRDLevelsin Strategic HRD planning-Training and Development and Strategies HRD effectiveness
5. Appreciate Human Resource Evaluation: Overview of evaluation - Approaches to evaluation,Evaluation Strategic contributions of Traditional Areas - Evaluating Strategic Contribution

of Emerging Areas Strategic contributions of Traditional Areas - Evaluating Strategic Contributionof Emerging Areas-HR as a Profit centre and HR outsourcing strategy

Course Objectives:

1.Strategic Human Resource Management (SHRM) explores the relationship between the management of people and pursuit of an organisations strategic goals and objectives.
2. Specific topics covered include human resource planning and strategy, job analysis and job design, equipment and selection, performance appraisal and performance-related pay, learning and career management.
3. Employment relations, diversity management and international human resource management
4.The concept strategic planning for HRD, levels in HRD planning Training and development Strategies are studied in Course
5.The approaches to evaluation evaluating strategic contribution of emerging areas and HR as a profit centre are also studied in this course

SYLLABUS

STRATEGIC HUMAN RESOURCE MANAGEMENT

UNIT-1

Human Resource Strategy: Introduction to Strategic Human Resource Management - Evaluation objectives and Importance of Human Resources Strategy- Strategic fit – A conceptual framework -Human Resources contribution to strategy - Strategy driven role behaviors and practices – Theoretical Perspectives on SHRM approaches - Linking business strategies to HR strategies.

UNIT-2

Strategic Human Resource Planning: Objectives, benefits, levels of strategic planning-

Activities related to strategic HR Planning-Basic overview of various strategic planning models-Strategic HR Planning model-Components of the strategic plan.

UNIT-3

Strategy Implementation: Strategy implementation as a social issue-The role of Human Resource-Work force utilization and employment practices-Resourcing and Retention strategies-Reward and Performance management strategies.

UNIT-4

Strategic Human Resource Development: Concept of Strategic Planning for HRDLevels in Strategic HRD planning-Training and Development Strategies-HRD effectiveness.

UNIT-5

Human Resource Evaluation: Overview of evaluation - Approaches to evaluation, Evaluation Strategic contributions of Traditional Areas - Evaluating Strategic Contribution of Emerging Areas-HR as a Profit centre and HR outsourcing strategy.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Charles R. Greer: “Strategic Human Resource Management” - A General Manager Approach - Pearson Education, Asia
2. Fombrum Charles & Tichy: “Strategic Human Resource Management” - John Wiley Sons, 1984
3. Dr. Anjali Ghanekar “Strategic Human Resource Management” Everest Publishing House, Pune 2009
4. Tanuja Agarwala “Strategic Human Resource Management” Oxford University Press, New Delhi 2014
5. Srinivas R Kandula “Strategic Human Resource Development” PHI Learning PVT Limited, New Delhi 2009
6. Dreher, Dougherty “Human Resource Strategy” Tata Mc Graw Hill Publishing Company Limited, New Delhi 2008

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Program Name: M.B.A Faculty Name: L.PRATHIBA

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	III	STRATEGIC MARKETING MANAGEMENT	MB 1637	12-07-2018

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams.

	This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.
PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
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PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Strategic Marketing is the way a firm effectively differentiates itself from its competitors by capitalizing on its strengths (both current and potential) to provide consistently better value to customers than its competitors. In principle it's that simple, but it means a lot more than getting creative with the marketing mix. Armed with a thorough understanding of the firm's capabilities and aspirations, the customer market and the competitive landscape, the Goal of Strategic Marketing (and the job of the strategic marketer) is to maximize a firm's positive differentiation over competitors in the eyes of its target market. It does this by answering 3 key questions; where, how and when should the business compete**.** In understanding this, it's no surprise that a Strategic Marketing Plan will often lay a framework for fundamental change in the way a firm works and how it engages its markets.

Course Outcomes:

1. **Analyze** the Role of Strategic Marketing - Key Definitions of Strategic Marketing - Role and Importance and concepts- Systematic approach - sequencing and scheduling of activities and integration of activities a n d Resource Requirements
2. **Infer** Strategic Marketing Strategy: Models - Organisation, Industry and market environment situation analysis; Porter's Five Forces model - Structure, Conduct and Performance and Marketing Audit.
3. **Understand** Marketing Techniques : Setting marketing objectives and marketing strategy -Targeting markets - Segmting maenrkets - Profiling markets- Positioning segmented markets, Direct or Indirect sales Strategy options
4. **Infer** Strategic marketing environment : Changes in the external environment: shift from supply to demand environment, fashionisation of markets; micro-markets;rising expectations and technologicalchange
5. **Appreciate** New Product Developments: Ability to customize - Ability to handle information to gain competitive advantage and e-marketing position - core focus and target markets, nature and potential of key market segments

Course Objetives:

1. To develop and implement of marketing strategy by providing a framework from which to identify and evaluate strategic options and programs.
2. Topics include forecasting and contextual possibilities, product-market definition, relationships with channels of distribution, relationships with customers, competitive analysis,.
3. This course requires that students have a strong foundation of marketing knowledge gained from Introduction to Marketing (in particular a knowledge of market segmentation)
4. Deliver an oral presentation in a professional, engaging manner
5. Financial models for marketing strategists, portfolio models, strategic assessment of offerings, marketing strategy implementation systems

SYLLLABUS

Unit-I:
STRATEGIC MARKETING MANAGEMENT

UNIT – 1

Introduction : Role of Strategic Marketing - Key Definitions of Strategic Marketing - Role and Importance and concepts- Systematic approach - sequencing and scheduling of activities and integration of activities -Resource Requirements – Time scaling - Processes: Strategic Marketing Planning Process - Strategic Marketing Analysis- marketing strategy objective setting- perceptual mapping - factor analysis, Option

Evaluation, Choice – Formulation and Implementation and Control Links to corporate strategy: Mission statement, organisational structure and corporate responsibility and ethics - dynamic strategy

UNIT -2

Strategic Marketing Strategy: Models - Organisation, Industry and market environment situation analysis; Porter's Five Forces model - Structure, Conduct and Performance; -Marketing Audit - portfolio analysis techniques -strategic positioning, defining the future position - Marketing Tactics - Product tactics -Price tactics- Promotion tactics - Place tactics-Direct response marketing strategies - Defensive strategies - Customer retention strategies-Personalised marketing; Payne and Ballantyne's Six markets model

UNIT -3

Strategic Marketing Techniques : Setting marketing objectives and marketing strategy -Targeting markets - Segmting maenrkets - Profiling markets- Positioning segmented markets, Direct or Indirect sales Strategy options - core competences - Competitive advantage -Investment opportunity evaluation - market leadership - Innovation strategies - Market pioneer -close followers, late followers; offensive, defensive and value-based marketing strategies Strategic marketing objectives: marketing mix – 7 Ps.

UNIT -4

Strategic marketing environment : Changes in the external environment: shift from supply to demand environment; fashionisation of markets; micro-markets;rising expectations; technologicalchange; competition;globalisation;importance of customerservice; commoditisation; erosion of brands; new constraints Strengths and weaknesses: focus of marketing objectives, links to corporate strategy.

UNIT - 5

New Product Developments: Ability to customize - Ability to handle information to gain competitive advantage - e-marketing position - core focus - target markets, nature and potential of key market segments, partnerships with customers and other stakeholders- Innovation strategies, timescales, resource requirements, budgets, monitoring, review and control mechanisms Strategic marketing responses: emerging themes eg impact of globalisation, the

1.Devid A Aaker and Damien Mc Loughlior: “Strategic Marketing Management”-Global Perspective” Wiley Publications.
2. Jean –Jacques Lambin : “Strategic Marketing Management”, McGraw –Hill, 3. Nag A: “Strategic Marketing”. MacMillons
4. Srinivas R, Lohith C.P.: “Strategic Marketing and Innovation” for Indian MSMEs”, Springer Publication.
5. Graeme Drummond, John Ensor, Ruth Ashfor: “Strategic Marketing Planning and Control”, Elsevier Publication.
6. Kotler P and Keller K L: “A Framework for Marketing Management”, Pearson Education, 2008

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Program Name: M.B.A Faculty Name:

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	IV	Financial Marketing	MB 1641	

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world

	situations.
PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

A Financial Marketing and services is a market in which people trade financial securities and derivatives such as futures and options at low transaction costs. Securities include stocks and bonds, and precious metals.

The term "market" is sometimes used for what are more strictly *exchanges*, organizations that facilitate the trade in financial securities, e.g., a stock exchange or commodity exchange. This may be a physical location (like the NYSE, BSE, LSE, JSE) or an electronic system (like NASDAQ). Much trading of stocks takes place on an exchange; still, corporate actions (merger, spinoff) are outside an exchange, while any two companies or people, for whatever reason, may agree to sell stock from the one to the other without using an exchange.

Trading of currencies and bonds is largely on a bilateral basis, although some bonds trade on a stock exchange, and people are building electronic systems for these as well, similar to stock exchanges.

Course Outcomes:

1.Analze the role financial system in economic development,financial markets and financial instruments, capital marketsl,money markets,primary market operation and role of SEBI

2.Infer the nature and scope of financial services,regulatory frame work of financial services,growth of financial services in India,Merchant Banking,Responsibilities of merchant bankers and regulations of merchant banking in india

3.Understand the growth of venture of capital in india,financing pattern and under venture capital,legal aspects and guidelines for venture capital,leasing and types of leases.

4.Analyze the debt rating system of CRISIL,ICRA and CARE,Factoring,Forfeiting and Bill Discounting, Types of Factoring arrangements and Factoring in the Indian Context

5.Appreciate the functions of portfolio classification,guidelines for mutual funds,working of public and private mutual funds in india,debt securitization and Demat Services.

Course Objectives:

1.To acquire the skills necessary to participate in managing a financial services company

2. To assess consumer financial needs and the mechanisms available for fulfilling these needs

3. To describe and apply financial concepts, theories and tools

4 . To evaluate the role of technology and the legal, ethical and economic environment as it relates to financial services

5. To prepare students who wish to practice personal financial planning

SYLLABUS

FINANCIAL MARKETS AND SERVICES

UNIT 1

Structure of Financial System: Role of Financial System in Economic Development – Financial Markets and Financial Instruments – Capital Markets – Money Markets – Primary Market Operations – Role of SEBI – Secondary Market Operations – Regulation – Functions of Stock Exchanges – Listing – Formalities – Financial Services Sector Problems and Reforms.

UNIT 2

Financial Services: Concept, Nature and Scope of Financial Services – Regulatory Frame Work of Financial Services – Growth of Financial Services in India – Merchant Banking – Meaning-Types – Responsibilities of Merchant Bankers – Role of Merchant Bankers in Issue Management – Regulation of Merchant Banking in India.

UNIT 3

Venture Capital: Growth of Venture Capital in India – Financing Pattern under Venture Capital – Legal Aspects and Guidelines for Venture Capital, Leasing – types of Leases – Evaluation of Leasing Option Vs. Borrowing.

UNIT 4

Credit Rating: Meaning, Functions – Debt Rating System of CRISIL, ICRA and CARE. Factoring, Forfeiting and Bill Discounting – Types of Factoring Arrangements – Factoring in the Indian Context;

UNIT 5

Mutual Funds: Concept and Objectives, Functions and Portfolio Classification, Organization and Mangement, Guidelines for Mutual Funds, Working of Public and Private Mutual Funds in India. Debt Securitisation – Concept and Application – De-mat Services-need and Operations-role of NSDL and CSDL.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Bhole & Mahakud, Financial Institutions and Market, TMH, New Delhi
2. DK Murthy, and Venugopal, Indian Financial System, IK Int Pub House
3. Anthony Saunders and MM Cornett, Fin Markets & Institutions,TMH, ND
4 Edminister R.D., Financial Institution, Markets and Management:
5. Punithavathy Pandian, Financial Markets and Services, Vikas, New Delhi
6. Vasanth Desai, Financial Markets & Financial Services, Himalaya, Mumbai

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Program Name: M.B.A Faculty Name:

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	IV	global financial	MB 1643	

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
64	Theory 4	Practical ----	3 Hours	Internal 40	External 60	2

Programme Outcomes:

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	This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.
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Programme Specific Outcomes:

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Course Context and Overview:

The global financial system is the worldwide framework of legal agreements, institutions, and both formal and informal economic actors that together facilitate international flows of financial capital for purposes of investment and trade financing. Since emerging in the late 19th century during the first modern wave of economic globalization, its evolution is marked by the establishment of central banks, multilateral treaties, and intergovernmental organizations aimed at improving the transparency, regulation, and effectiveness of international markets.[1] In the late 1800s, world migration and communication technology facilitated unprecedented growth in international trade and investment. At the onset of World War I, trade contracted as foreign exchange markets became paralyzed by money market illiquidity.

Course Outcomes:

1.Analze the globalization of MNC's –Global Winds of change,new challenges and opportunities,regulatory,legal frame work,global organization restricting,international monitory system, exchange rates and par values and special drawing rights (SDR)

2.Infer the balance of payments,International trade flow,time factor in international analysis,hedging in swap markets and management of international of transaction exposure

3. understand operation strategies of MNC'S management of GLOBAL Business practices, sources of funds for MNC'S, operation in international financial markets and intercorporate funds flow

4.Appreciate foreign direct investment,international capital budgeting,evaluation management of political rist,global portfolio investment and international global financial decision

5.Understand External Resource and development,factor influencing debt crisis,management of external indebtness and challenges,short financing and internal financing by MNC'S

Course Objectives:

1.To provide an understanding of financial management in an international Setting and determination of exchange rates, and their relationship with interest rates and inflation consequences of misalignment of exchange rates, the origins of financial crises.

2.To enable the student Understand various exchange rate regimes

3. To enable the student identify necessary actions Goals are general statements of desired achievement, while objectives are the specific steps or actions take to reach goal

4. 4.To acquaint the students is quite likely to use several of investment objectives simultaneously to accomplish different objectives without any conflict

5. To enable the student to be fully accurate, one should refer to the multiple debt crises that exist in the world today

GLOBAL FINANCIAL MANAGEMENT

UNIT 1

Introduction to Global Financial Management: Globalization and MNCs- Global Winds of Change- New Challenges and Opportunities- Importance of Global Factors- Regulatory and Legal Frame Work- Global Organizational Restructuring- International Monitory System- Exchange Rates and Par Values- International Monitory Reforms- Special Drawing Rights (SDR) –SDR Allocation.

UNIT 2

Management of Exchange and Interest Rates Exposure: Determination of Exchange Rates- Balance of Payments (Equilibrium vs Disequilibrium)- International Trade Flow- Time factor in International Risks- Hedging in Swap Market- Measurement of Politico Economics Risk- Management of International Transactions Exposure.

UNIT 3

Management of Global Business Operations and Practices: Operational Strategies of MNCs- Management of Global Business Practices- Sources of funds for MNCs- Operations in International Financial Markets- Inter-Corporate Funds Flow- Market for Currency Futures and Currency Options.

UNIT 4

International Investment Decision : Foreign Direct Investment- International Capital Budgeting- Evaluation and Management of Political Risk- Global Portfolio Investment- International Global Financial Decisions- Role of Multi Lateral Development Banks- Global Financial Market Instruments- Management of Interest Rate Risk- Shorter Asset and Liability Management.

UNIT 5

Global Indebtedness: External Resources and Development- Nature and Magnitudes of External Debt- Factors influencing Debt Crisis- Management of external Indebtedness and Challenges- Short - Term Financing- Internal Financing by MNCs.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Jeff Madura, " International Financial Management" Cengage Learning Limited, 2008.
2. PG Apte, "International Financial Management" Tata McGraw Hill Limited, 2009.
3. Vyuptakesh Sharan, "International Financial Management" PHI, 2012.
4. V.A. Avadhani, "International Financial Management" Himalaya Publishing House, 2009

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Course Content :

UNIT 1

Introduction to Global Financial Management: Globalization and MNCs- Global Winds of Change- New Challenges and Opportunities- Importance of Global Factors- Regulatory and Legal Frame Work- Global Organizational Restructuring- International Monitory System- Exchange Rates and Par Values- International Monitory Reforms- Special Drawing Rights (SDR) –SDR Allocation.

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Management of Exchange and Interest Rates Exposure: Determination of Exchange Rates- Balance of Payments (Equilibrium vs Disequilibrium)- International Trade Flow- Time factor in International Risks- Hedging in Swap Market- Measurement of Politico Economics Risk- Management of International Transactions Exposure.

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3. Vyuptakesh Sharan, "International Financial Management" PHI, 2012.

4. V.A. Avadhani, "International Financial Management" Himalaya Publishing House, 2009

Additional Resources (NPTEL, Web resources etc.):

Table 1: Computation of CO-PO/PSO mapping

CO	Course Outcome	PO	PSO	CL(Cognitive level)	Class Sessions
CO 1	Analze the globalization of MNC's –Global Winds of change,new challenges and opportunities,regulatory,legal frame work,global organization restricting,international monitory system, exchange rates and par values and special drawing rights (SDR) .	1,2,3, 4	1, 2, 3	EV	14
CO 2	.Infer the balance of payments,International trade flow,time factor in international analysis,hedging in swap markets and management of international of transaction exposure	1, 3,4, 5,	1,2,3	AP	13
CO 3	understand operation strategies of MNC'S management of GLOBAL Business practices, sources of funds for MNC'S, operation in international financial markets and intercorporate funds flow	1,2, 4, 5	1, 2,3	EV	15
CO 4	.Appreciate foreign direct investment,international capital budgeting,evaluation management of political rist,global portfolio investment and	1,2, 3, 5,	1, 2, 3	AP	12

	international global financial decision .				
CO 5	Understand External Resource and development,factor influencing debt crisis,management of external indebtness and challenges,short financing and internal financing by MNC'S .	2, 3, 4, 5,	1, 2, 3	EV	14
Total Hours of instruction					68

Table 2: Reason for selection of POs & PSOs

Program Outcome	
PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. .
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues.

	.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers .
PO5.	**Develop Managerial and Entrepreneurial Skills:** Students can be expected to demonstrate high level of oral and written communication skills for marketing and operational activities. Students can gain the critical entrepreneurial skills by thinking creatively and innovatively.Selected as the Entrepreneurial skills are essential for the management graduates who are willing to establish their own business.
PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme.
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn"
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job.

Date: Signature of the Faculty

(Name of the Faculty)

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Program Name: M.B.A Faculty Name: S.Praveen

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	I	**Leadership** management	MB 1613	13-08-2017

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
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Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
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Course Context and Overview:

With the advent of globalization, organizations - big or small have ceased to be local, they have become global! This has increased the workforce diversity and cultural sensitivities have emerged like never before. All this led to the development of Global Human Resource Management.Even those organizations who consider themselves immune to transactions across geographical boundaries are connected to the wider network globally. They are in one way or the other dependent upon organizations that may even not have heard about. There is interdependence between organizations in various areas and functions.

Course Outcomes:

1.Understand the meaning and nature of change, programmes,change levers,change as transformation, change as turnaround, value based change.
2.Appreciate the reviews of basic flow diagramming techniques,system relationships, system diagramming,influence charts, multiple cost background,system approaches to change,system autonmy behavior,intervention strategy model and the Total Project Management Model (TPMM)
3.Analyze the organizational development,nature and scope of OD, dynamics of planned change,person focused and role focused OD interventions, planning OD strategies and OD intervention in Indian Organizations.
4.Appreciate Management relations in the post-liberalized India-collective bargaining strategy to the challenges of Globalization and the restructuring of enterprise in India changes in the legal frame work of collective bargaining and Negotiated flexibility.
5. Infer the nature of Team building and importance of teams, Team Vs Groups, Types of Teams, Characterstics of virtual teams, self managing teams,building teams, empowered teams, leadership quantities,managing cross-cultural,diversity in teams and group think as a decision making process

Course Objectives:

1. Understand the global HR perspective in New Economy, Challenges of globalization, Implications of Managing People and Leveraging Human Resources, Conflicts, Strategic Role of International HRM, Global HR Planning, Staffing Policy, Training & Development, Performance Appraisal and International Labour relations .
2. Analyze the management of International Assignments, Selection methods, Positioning Expatriate, Repatriate, Factors of consideration and International Assignments for Women Problems.
3. Infer the Cross cultural Management, Concepts and issues, Consideration of problems, Skill building methods, Cross cultural communications and Cross culture teams.
4. Analyze the concept of compensation management, trends issues and methods, factors of consideration, models, incentive methods and global compensation implications on Indian systems.
5. Appreciate Global Strategic Advantages through HRD, measures for creating global HRD climate, Strategic frame work of HRD and challenges, Globalization and Quality of working life and productivity.

SYLABUS

Global HRM

UNIT 1

Introduction: A Global HR Perspective in New Economy-Challenges of Globalization -Implications of Managing People and Leveraging Human Resource- - Conflicts - Strategic Role of International HRM – Global HR Planning – Staffing policy – Training and development – performance appraisal – International Labour relations – Industrial democracy – Talent crunch – Indian MNCs and Challenges - Legal content of Global HRM.

UNIT 2

Managing International Assignments: Significance – Selection methods - Positioning Expatriate – Repatriate – factors of consideration - Strategies - International assignments for Women - Problems.

UNIT 3

Cross Culture Management: Importance – Concepts and issues – theories- considerations - Problems – Skill building methods – Cross Culture Communication and Negotiation – Cross Culture Teams.

UNIT 4

Compensation Management: Importance – Concepts- Trends - Issues – Methods – Factors of Consideration – Models – incentive methods – global compensation implications on Indian systems - Performance Management.

UNIT 5

Global Strategic Advantages through HRD: Measures for creating global HRD Climate – Strategic Frame Work of HRD and Challenges - Globalization and Quality of Working Life and Productivity – Challenges in Creation of New Jobs through Globalization- New Corporate Culture

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Subba Rao P: "International Human Resource Management", Himalaya Publishing House, Hyderabad, 2011

2. NilanjanSen Gupta: "International Human Resource Management Text and cases" Excel Books, New Delhi.

3. Tony Edwards :"International Human Resource Management", Pearson Education, New Delhi, 2012

4. Aswathappa K, Sadhana Dash: "International Human Resource Management, TMH, New Delhi,

5. Monir H Tayeb: "International Human Resource Management", Oxford Universities Press, Hyderabad, 2012.

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Program Name: M.B.A Faculty Name:

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	IV	**GLOBAL MARKETING MANAGEMENT**	MB 164D	

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
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64	4	----	3 Hours	40	60	2

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Course Context and Overview:

Global marketing management is "marketing on a worldwide scale reconciling or taking commercial advantage of global operational differences, similarities and opportunities in order to meet global objectives"Global marketing is also a field of study in general business management to provide valuable products, solutions and services to customers locally, nationally, internationally and worldwide.International marketing is the export, franchising, joint venture or full direct entry of an organization's product or services into another country. This can be achieved by exporting a company's product into another location, entry through a joint venture with another firm in the target country, or foreign direct investment into the target country. The development of the marketing mix for that country is then required - international marketing. It can be as straightforward as using existing marketing strategies, mix and tools for export on the one side, to a complex relationship strategy including localization, local product offerings, pricing, production and distribution with customized promotions, offers, website, social media and leadership

Course Outcomes:

1.Analyze the scope and significance of global marketing ,difference between global and domestic marketing growing attractiveness of developing country market,international orientation stage of internalization and driving and restraining forces of global markets.

2.Infer international marketing strategy,entry strategies in global markets,global market segmentation,international targeting,criteria for targeting,selecting as global market,global product positioning strategy and strategies for FDI'S and FIIS.

3.Understand international product mix,managing global research and development for product management,product diffusion and adoption in global markets international product life cycle and product culture, global brand leadership and transfer pricing.

4.Appreciate global marketing channels and promotions for global markets,innovations in global channels,channel strategy from new market entry,global distribution patterns,selecting foreign country market intermediaries and EXIM policy of india

5.Analze the export procedures and documents,confirmation of offer,export license,finance,production/procurement of goods,shipping space,backing and marketing,quality control exercise cleareness,customs formalities and negotiations and documents.

Course Objectives:

1. To enable the student from management streams who aspire to learn the basics of International Marketing
2. To enable the student To enhance free trade at global level and attempt to bring all the countries together for the purpose of trading
3. To enable the student function within a company dealing with the planning, forecasting, and production, or marketing of a product or products at all stages of the product lifecycle
4. To enable the student the design of global channels and the management of global channels
5. To enable the student about the export and import procedures and formalities of Customs department

SYALLABUS

UNIT 1:

Introduction to Global Marketing: Scope and Significance of global Marketing, - Difference between global and domestic marketing – The growing attractiveness of developing country market – International orientations, Stages of internationalization, Driving and restraining forces of global markets, Participants in 3international marketing.

UNIT 2:

International marketing strategy: Entry strategies in Global markets – modes of entries in global markets – global market segmentation – international targeting – criteria for targeting, selecting a global target market – Global product positioning strategy. Business Customs in global Market – strategies for FDI and FIIs - Entry Strategies of Indian Firms

UNIT 3:

Global Product & Price management: International product mix – Managing Global Research and Development for product management– Product diffusion and adoption in global markets – International Product Life Cycle – Product and culture – Global brand leadership – : Environmental influences on Pricing Decisions – Grey Market goods – Transfer pricing – Global Pricing – Policy Alternatives – Constraints on global pricing

UNIT 4:

Global Marketing Channels and Promotion for global markets: channels – Innovations in global channels – Channel strategy for new market entry – Distribution Structures – Global Distribution Patterns - Challenges in Managing An Global Distribution Strategy – Selecting Foreign Country Market intermediaries - Global Advertising and branding - Export Policy Decisions of a firm - Export costing and pricing – EXIM policy of India.

UNIT 5:

Export procedures and documents: Preliminaries: inquiry and offer – confirmation of offer – export license – finance – production /procurement of goods – shipping space – packing and marketing – quality control and pre – shipment inspection – excise clearance – customs formalities – negotiation and documents – standardization and aligned pre-shipment documents – documents related to goods – documents related to shipments.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Francis Cherunilam: International marketing, 11th Edition, Himalaya Publication House,2010

2. Warren J Keegan: Global Marketing Management, 5th Edition, Prentice Hall of India Private Limited

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Program Name: M.B.A Faculty Name:

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	IV	HUMAN RESOURCE MANAGEMENT	MB 1649	

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams.

	This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.
PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Human resources overall purpose is to ensure that the organization is able to achieve success through people. HR professionals manage the human capital of an organization and focus on implementing policies and processes. They can specialize in recruiting, training, employee-relations or benefits. Recruiting specialists find and hire top talent. Training and development professionals ensure that employees are trained and have continuous development. This is done through training programs, performance evaluations and reward programs. Employee relations deals with concerns of employees when policies are broken, such as in cases involving harassment or discrimination.

Course Outcomes:

1. Analyze the evolution of HRM principles, ethical aspects of HRM, HRM policies, strategies to increase firms,roles in position HRD , aligning HR strategy with organizational strategy, HRM at global level and persepectives and challenges
2. Infer the Nature of HR planning sources of the Recruitment And Test And Interview Techniques , Training And Development and Retention and Job Analysis
3. Understand traditional and modern methods of performance appraisal, career development ,counseling,compensation concepts, current trends in compensation methods of performance appraisal
4. .Appreciate wage and salary administration, determines of Wages ,Payments Of Wages And Incentives Payment Schemes and Welfare Measures.
5. Analyze the concept of trade unions Employee Participation Schemes, Safety Of Work and Management Of Stress

Course Objectives:

1. To identify the importance of human resources and their effective management in organizations
2. Demonstrate a basic understanding of different tools used in forecasting and planning human resource needs.
3. Analyze the key issues related to administering the human elements such as motivation, compensation, appraisal, career planning, diversity, ethics, and training.
4. Analyze the role of recruitment and selection in relation to the organization's business and HRM objectives in a Saudi Arabian context. This includes demonstrating the appropriate use of job descriptions, application forms and related staffing tools such as internet recruiting.
5. Develop, analyze and apply advanced training strategies and specifications for the delivery of training programs

HUMAN RESOURCE MANAGEMENT

UNIT 1

HRM: Significance - Definition and Functions – evolution of HRM- Principles - Ethical Aspects of HRM- - HR policies, Strategies to increase firm performance - Role and position of HR department –aligning HR strategy with organizational strategy - HRM at global perspectivechallenges
– cross-cultural problems – emerging trends in HRM.

UNIT 2

Investment perspectives of HRM: HR Planning – Demand and Supply forecasting - Recruitment and Selection- Sources of recruitment - Tests and Interview Techniques - Training and Development – Methods and techniques – Training evaluation - retention - Job Analysis – job description and specifications - Management development - HRD concepts.

UNIT 3

Performance Appraisal: Importance – Methods – Traditional and Modern methods – Latest trends in performance appraisal - Career Development and Counseling- Compensation, Concepts and Principles- Influencing Factors- Current Trends in Compensation- Methods of Payments -

compensation mechanisms at international level.

UNIT 4

Wage and Salary Administration: Concept- Wage Structure- Wage and Salary Policies- Legal Frame Work- Determinants of Payment of Wages- Wage Differentials - Job design and Evaluation- - Incentive Payment Systems. Welfare management: Nature and concepts – statutory and non-statutory welfare measures – incentive mechanisms

UNIT 5

Managing Industrial Relations: Trade Unions - Employee Participation Schemes-Collective Bargaining–Grievances and disputes resolution mechanisms – Safety at work – nature and importance – work hazards – safety mechanisms - Managing work place stress.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. K Aswathappa: "***Human Resource and Personnel Management***", Tata McGraw Hill, New Delhi, 2013
2. N.Sambasiva Rao and Dr. Nirmal Kumar: "**Human Resource Management and Industrial Relations**", Himalaya Publishing House, Mumbai
3. Mathis, Jackson,Tripathy:"***Human Resource Management:Asouth-Asin Perspective***",
Cengage Learning, New Delhi, 2013
4. Subba Rao P: "***Personnel and Human Resource Management-Text and Cases***", Himalaya Publications, Mumbai, 2013.
5. Madhurima Lall, Sakina Qasim Zasidi: "**Human Resource Management**", Excel Books, New Delhi, 2010

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Program Name: M.B.A Faculty Name:

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	IV	LABOR WELFARE AND LEGISLATION	MB164B	

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can

	use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.
PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to “Earn while they Learn” Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Labour welfare is a flexible and elastic concept. Its meaning and implications differ widely with times, regions, industries, countries, social values and customs, the general economic development of the people and the political ideologies prevailing at particular moments. As such, a precise definition is rather difficult. The most important benefit of industrial relations is that this ensures continuity of production. This means, continuous employment for all from manager to workers. The resources are fully utilized, resulting in the maximum possible production. There is uninterrupted flow of income for all. Smooth running of an industry is of vital importance for several other industries; to other industries if the products are intermediaries or inputs; to exporters if these are export goods; to consumers and workers, if these are goods of mass consumption

Course Outcomes:

1. Understand the welfare registration, factories act 1948, mines act 1952, plantation labour act 1951, contract labour act 1970 and A.P.Shops and Establishments Act.
2. Appreciate the industrial relations legislation, industrial disputes act 1947, in industrial employment act 1946, trade unions act 1926.
3. Infer the wage and Social Security Legislation, payment of wages act 1936, minimum wages act 1948, payment of bonus act 1966, workmen's compensation act 1923 and Employee State Insurance Act 1948.

4. Analyze the concept scope and philosophy of labour welfare, agencies of labour welfare, impact of ILO on labour welfare in India, absenteeism and alcoholism.
5. Understand the statutory and non-statutory, extra mural and intra mural, central board of workers education, workers cooperatives, welfare centers, welfare officers role.

Course Objectives:

1. To enable the student to make the management feel the employees are satisfied about the work and working conditions
2. To enable the student establish and nurse industrial democracy based on labour partnership in the sharing of profits and of managerial decisions
3. To enable the student ensure a just and equitable share of the fruits of progress to all, and a minimum living wage to all who are employed and in need of such protection
4. To enable the student Make the plant personnel a healthier, sounder-thinking and more forward-looking group.
5. To enable the student To make analytical study and the interpretation of the labour welfare schemes introduced by the various agencies in public limited companies

SYLLABUS

LABOR WELFARE & LEGISLATION
UNIT 1
Welfare Legislation: Factories Act 1948, Mines Act 1952, Plantation Labour Act 1951, Contract Labour (Regulation and Abolition) Act 1970 and A.P.Shops and Establishments Act.
UNIT 2
Industrial Relations Legislation: Industrial Disputes Act 1947; Industrial Employment (standing orders) Act 1946 and Trade Unions Act 1926.
UNIT 3
Wage and Social Security Legislation: Payment of wages Act 1936 - Minimum wages Act 1948 - Payment of Bonus Act 1966 -. Payment of Gratuity Act 1972 - Workmen's Compensation Act 1923 -

Employees State Insurance Act 1948 - Maternity Benefit Act 1961 and Employees Provident Fund and Miscellaneous Provisions Act 1952.

UNIT 4

Labour Welfare: Concept, scope and philosophy, principles of labour welfare, Indian constitution on labour, Agencies of labour welfare and their role. Impact of ILO on labour welfare in India. Labour problems – Indebtedness, Absenteeism, Alcoholism, Personal and Family Counselling.

UNIT 5

Labour welfare programmes: Statutory and non-statutory, extra mural and intra mural, Central Board of Workers' Education; Workers' Cooperatives; Welfare Centers, Welfare Officers' Role, Status and Functions. Role of social work in industry.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Govt. of India (Ministry of Labour, 1969). Report of the Commission on Labour Welfare, New Delhi: Author.
2. Govt. of India (Ministry of Labour, 1983). Report on Royal Commission on Labour in India, New Delhi: Author.
3. Malik, P.L: "Industrial Law", Eastern Book Company. Laknow,1977
5. Moorthy, M.V: "Principles of Labour Welfare", Oxford University Press, New Delhi.
6. Pant, S.C: "Indian Labour Problems", Chaitanya Pub. House. Allahabad.

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Program Name: M.B.A Faculty Name:

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	IV	MANAGEMENT OF INDUSTRIAL RELATIONS	MB164F	

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can

	use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.
PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Industrial relations has become one of the most delicate and complex problems of modern industrial society. Industrial progress is impossible without cooperation of labors and harmonious relationships. Therefore, it is in the interest of all to create and maintain good relations between employees (labor) and employers (management). The term 'Industrial Relations' comprises of two terms: 'Industry' and 'Relations'. "Industry" refers to "any productive activity in which an individual (or a group of individuals) is (are) engaged". By "relations" we mean "the relationships that exist within the industry between the employer and his workmen

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Course Outcomes:

1. Understand the concept of Industrial Relations Management, Background of Industrial Relations in India, concept of factors influencing IR in enterprises and consequences, economic, social and political environments, employment structure, and social partnership.
2. Appreciate the concept of trade unions, growth of trade unions in India, TRADE UNIONS ACT 1926 AND Legal frame work, Union Recognition, Union problems and employees association.
3. Infer the quality of work life, workers participation in management, worker's participation in India, shop floor, plant level, board level, worker's welfare in Indian Scenario, Collective bargaining concepts & characteristics, promoting peace, Wage and salary administration and incentives & fringe benefits.
4. Analyze the concept of Social Security in India, Health and occupational safety programs, Salient features of Workmen compensation act and employees state insurance act and worker's education objectives.
5. Understand Employee Grievances, causes of grievances, conciliation, arbitration and adjudication, procedural aspects for settlement of Grievances, standing orders, code discipline, industrial disputes and prevention and settlements of industrial disputes in India.

Course Objectives:

1. For creating an understanding of change and organizational development processes.
2. Based on case studies which address multiple perspectives of organizational change, the topics will be reflected from a theoretical and practical point of view.
3. Special attention will be given to the role of leadership in the context of change management and organizational development.
4. To manage the behavioral changes of their stakeholders based on their knowledge on human Communication and change management
5. To infer types of teams, characteristics of virtual teams, team building cycle and team building.

SYLLABUS

MANAGEMENT OF INDUSTRIAL RELATIONS

UNIT 1

Industrial Relations Management: Concept- Evaluation –Background of industrial Relations in India- Influencing factors of IR in enterprise and the consequences. Economic, Social and Political environments- Employment Structure –Social Partnership-Wider approaches to industrial relations-Labour Market.

UNIT 2

Trade Unions: Introduction-Definition and objectives-growth of Trade Unions in India-trade Unions Act , 1926 and Legal framework-Union recognition-Union Problems-Employees Association-introduction ,Objective Membership, Financial Status.

UNIT 3

Quality of Work Life: Workers' Participation in Management - Worker's Participation in India, shop floor, Plant Level, Board Level- Workers' Welfare in Indian scenario- Collective bargaining concepts & Characteristics –Promoting peace.Wage and Salary administration: Nature & Significance of wage, salary administration, essentials- Minimum wage- Fair wage, Real wage, Incentives & fringe benefits. Issues and Constraints in Wage Determination in India.

UNIT 4

Social Security: Introduction and types –Social Security in India, Health and Occupational safety programs- Salient features of Workmen Compensation Act and Employees' State Insurance Act relating to social security – Workers' education objectives -Rewarding.

UNIT 5

Employee Grievances: Causes of Grievances –Conciliation, Arbitration and Adjudication procedural aspects for Settlement of Grievances –Standing Orders- Code Discipline. Industrial Disputes: Meaning, nature and scope of industrial disputes - Cases and Consequences of Industrial Disputes –Prevention and Settlement of industrial disputes in India.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. C.S Venkataratnam: "**Industrial Relations**", Oxford University Press, New Delhi, 2011

2. Sinha: "**Industrial Relations, Trade Unions and Labour Legislation**", Pearson Education, New Delhi, 2013

3. Mamoria: "**Dynamics of Industrial Relations**", Himalaya Publishing House, New Delhi, 2010

4. B.D.Singh: "**Industrial Relations**" Excel Books, New Delhi, 2010

5. Arun Monappa: "**Industrial Relations**", TMH, New Delhi. 2012

6. Prof. N.Sambasiva Rao and Dr. Nirmal Kumar: "**Human Resource Management and Industrial Relations**", Himalaya Publishing House, Mumbai

7. Ratna Sen: "**Industrial Relations**", MacMillon Publishers, New Delhi, 2011

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Program Name: M.B.A Faculty Name:

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	IV	ORGANIZATION DEVELOPMENT & CHANGE MANAGEMENT	MB 164C	

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
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PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers

	Selected as experiential knowledge and team work will enable the business graduates real world situations.
PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Organization development and Change Management is the study of successful organizational change and performance. OD emerged from human relations studies in the 1930s, during which psychologists realized that organizational structures and processes influence worker behavior and motivation. More recently, work on OD has expanded to focus on aligning organizations with their rapidly changing and complex environments through organizational learning, knowledge management and transformation of organizational norms and values. Key concepts of OD theory include: organizational climate (the mood or unique "personality" of an organization, which includes attitudes and beliefs that influence members' collective behavior), organizational culture (the deeply-seated norms, values and behaviors that members share) and organizational strategies (how an organization identifies problems, plans action, negotiates change and evaluates progress).

Course Outcomes:

1.Understand the meaning and nature of change, programmes,change levers,change as transformation, change as turnaround, value based change.
2.Appreciate the reviews of basic flow diagramming techniques,system relationships, system diagramming,influence charts, multiple cost background,system approaches to change,system autonmy behavior,intervention strategy model and the Total Project Management Model (TPMM)
3.Analyze the organizational development,nature and scope of OD, dynamics of planned change,person focused and role focused OD interventions, planning OD strategies and OD intervention in Indian Organizations.
4.Appreciate Management relations in the post-liberalized India-collective bargaining strategy to the challenges of Globalization and the restructuring of enterprise in India changes in the legal frame work of collective bargaining and Negotiated flexibility.
5. Infer the nature of Team building and importance of teams, Team Vs Groups, Types of Teams, Characterstics of virtual teams, self managing teams,building teams, empowered teams, leadership quantities,managing cross-cultural,diversity in teams and group think as a decision making process

Course Objectives:

1.For creating an understanding of change and organizational development processes.
2. Based on case studies which address multiple perspectives of organizational change, the topics will be reflected from a theoretical and practical point of view.
3. Special attention will be given to the role of leadership in the context of change management and organizational development.
4. To manage the behavioural changes of their stakeholders based on their knowledge on human communication and change management
5.To infer types of teams,characterstics of virtual teams,team building cycle and team building

SYLLABUS

ORGANIZATIONAL DEVELOPMENT & CHANGE MANAGEMENT

UNIT 1

Basics of Change Management: Meaning, nature and Types of Change – change programmes – change levers – change as transformation – change as turnaround – value based change.

UNIT 2

Mapping change: The role of diagramming in system investigation – A review of basic flow diagramming techniques –systems relationships – systems diagramming and mapping, influence charts, multiple cause diagrams- a multidisciplinary approach -Systems approach to change: systems autonomy and behavior – the intervention strategy model – total project management model (TPMM). Learning organization: The relevance of a learning organization - strategies to build a learning organization

UNIT 3

Organization Development (OD): Meaning, Nature and scope of OD - Dynamics of planned change – Person-focused and role-focused OD interventions –Planning OD Strategy – OD interventions in Indian Organizations – Challenges to OD Practioners

UNIT 4

Negotiated Change: Change in the labour - management relations in the post-liberalized India – collective bargaining strategy to the challenges of Globalization and the restructuring of enterprises in India - Changes in the legal frame work of collective bargaining - Negotiated flexibility, productivity bargaining, improved work relations, public sector bargaining and social security.

UNIT 5

Team Building: Nature and Importance of Teams – Team Vs Groups – Types of teams – Characteristics of Virtual teams – Team building life cycle – Team building skills – Virtual team - High performance teams – self managing teams – Building team relationships – empowered teams – leadership on teams – Managing cross –cultural diversity in teams – Group think as a decision making process – effective decision making techniques for teams and groups – role of change consultant-– contemporary issues in managing teams.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Cummings: "Theory of Organisation Development and Change", Cengage Learning, New Delhi, 2013.
2. Robert A Paton: Change Management, Sage Publications, New Delhi, 2011.
3. NilanjanSengupta: Managing Changing Organisations, PHI Learning, New Delhi, 2009
4. Adrian Thornhill: Managing Change, Pearson Education, New Delhi, 2012.
5. Radha R Sharma: Change Management, TMH, New Delhi, 2012

Program Name: M.B.A Faculty Name:

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	IV	**PROMOTIONAL AND DISTRIBUTION MANAGEMENT**	MB1649	

<table>
<tr><td>Total No.of Hours for Teaching-Learning</td><td colspan="2">Instructional Hours for Week</td><td>Duration of semester End Examination in Hours</td><td colspan="2">Max Marks</td><td>Credits</td></tr>
<tr><td rowspan="2">64</td><td>Theory</td><td>Practical</td><td rowspan="2">3 Hours</td><td>Internal</td><td>External</td><td rowspan="2">2</td></tr>
<tr><td>4</td><td>----</td><td>40</td><td>60</td></tr>
</table>

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.

PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams. This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.
PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

In marketing, Promotional and Distribution Management refers to any type of marketing communication used to inform or persuade target audiences of the relative merits of a product, service, brand or issue. The aim of promotion is to increase awareness, create interest, generate sales or create brand loyalty. It is one of the basic elements of the market mix, which includes the four P's: price, product, promotion, and place.

Promotion is also one of the elements in the promotional mix or promotional plan. These are personal selling, advertising, sales promotion, direct marketing publicity and may also include event marketing, exhibitions and trade shows.[2] A promotional plan specifies how much attention to pay to each of the elements in the promotional mix, and what proportion of the budget should be allocated to each element.

Course Outcomes:
1.Infer sales display promotions,sales promotion objectives,types of sales displays,tools of sales promotion,sales promotion strategies, customer price perception,perceived risk and attitudes and types of promotions
2.Analyze physical distribution management the concepts of total distribution and cost trade off, customer service standards,physical distribution and its challenges and major logistics function
3.understand emergence of marketing channel structure and types of marketing channels,problems and distribution selection of distribution and channel decision
4.analyze the concept of whole saling,agent wholesaling middle men ,patterns in wholesaling,whole saler market decision, ideal channel structure and implementation of channel design
5.infer business ethics and sales management, ethical issues facing sales managers, managing sales ethics,building sales ethics programme,international distribution and challenges in managing international distribution strategy

Course Objectives:

1. 1.To identify core concepts of marketing and the role of marketing in business and society

2. . To aware knowledge of social, legal, ethical and technological forces on marketing decision-making

3. For appreciation for the global nature of marketing and appropriate measures to operate effectively in international settings.
4. To provide ability to develop marketing strategies based on product, price, place and promotion objectives
5. To create an integrated marketing communications plan which includes promotional strategies and measures of effectiveness

SYLLABUS
UNIT 1
Introduction to Promotional Management: Sales Display and Sales Promotion- Sales Promotion Objectives- Types of Sales Displays- Factors Influencing Sales Promotion- Tools of Sales Promotion- Sales Promotion Strategies- Sales Promotion and Consumer Behavior- Consumers Price Perceptions- Perceived Risk and Attitudes- Types of Promotion.
UNIT 2
Introduction to Distribution Management: Physical Distribution Management- The Concepts of Total Distribution Costs and Cost Trade-offs-

Customer Service Standards- Strategic Issues in Physical Distribution- Challenges and Opportunities- From Physical Distribution to Marketing Logistics- Major Logistics Functions

UNIT 3

Marketing Channels: Nature and Importance of Marketing Channels- Emergence of Marketing Channel Structures- Types of Marketing Channels- Direct Marketing Channels vs Indirect Marketing Channels- Problems in Distribution- Selection of Distribution Channels- Channel Decisions

UNIT 4

Channel Institutions and Designing Channel System: Wholesaling- Agent Wholesaling Middle Man- Patterns in Wholesaling- Wholesaler Marketing Decision- Changing Patterns- Channel Design Decisions- Channel Design Comparison Factors- Ideal Channel Structure- Types of Channels- Implementation and Integration of Channel Design.

UNIT 5

Ethical and Social Issues in Distribution Management: Business Ethics and Sales Management- Ethical Issues facing Sales Managers- Managing Sales Ethics- Modeling Ethical Behavior- Making Decisions on Ethical Problems- Building a Sales Ethics Programme- International Distribution- Challenges in Managing an International Distribution Strategy.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. K. Shridhara Bhat: "**Sales and Distribution Management**", Himalaya Publishing House, 2011.
2. Dr. Matin Khan: "**Sales and Distribution Management**", Excel Books, New Delhi, 2005

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Program Name: M.B.A Faculty Name:

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	IV	**Risk Management**	MB 1644	

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
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Course Context and Overview:

Risk management is the identification, evaluation, and prioritization of risks (defined in ISO 31000 as *the effect of uncertainty on objectives*) followed by coordinated and economical application of resources to minimize, monitor, and control the probability or impact of unfortunate events[1] or to maximize the realization of opportunities.Risks can come from various sources including uncertainty in financial markets, threats from project failures (at any phase in design, development, production, or sustainment life-cycles), legal liabilities, credit risk, accidents, natural causes and disasters, deliberate attack from an adversary, or events of uncertain or unpredictable root-cause. There are two types of events i.e. negative events can be classified as risks while positive events are classified as opportunities. Several risk management standards have been developed including the Project Management Institute, the National Institute of Standards and Technology, actuarial societies, and ISO standards..

Course Outcomes:

1.Analyzing role of financial institutions, future trends and global issues, financial services provided by intermediaries,need of risk management,risk management framework in organization and identification of faces.

2. Infer the measure interest rate risk,market rate risk,measurement of credit risk,measurement of operational and technologies and measurement of foreign exchange and sovereign risk.

3.Understand risk management tools interest rates,market risk management,credit risk management,operational risk management,foreign exchange and sovereign and liquidity risk management.

4.Appreciate regulatory and other issues in risk management,revised RBI risk management,organizational structure for market and credit risk, SEBI, NHP and Bank for International Settlement

5.Analze the Time Value of Money Advanced Bond Concepts,caluculation of VAR,Black Scholes Moody's KMV portfolio Manager,probability Distribution and Fundamental of Statistics and Derivative Products and its Markets.

Course Objectives:

1. To provide an understanding and an appreciation of the principles and practices of risk management in order to enable production of the optimum strategy for the handling of risk in an organization
2. . To explore the subject of financial risk management.
3. To analyze the processes of risk identification, risk measurement and risk management are explored.
4. The examine reputational risk and operational risk.

5. To analyze time value of money,advanced bond concepts,caluculation of VAR, Black-Scholes Model and Moody's KMV Portfolio Manager.

SYLLABUS

UNIT1

Introduction to Risk Management: Role of Financial Institutions- Future Trends and Global Issues- Financial Services provided by Intermediaries- Need of Risk Management- What is Risk- Sources of various Risk- Risk Management frame work in Organization- Identification of Risks like Liquidity Risk, Market Risk, Foreign Exchange Risk, Operational Risk etc.

UNIT 2

Measurement of Risks: Measurement of Interest Rate Risk and Market Rate Risk- Measurement of Credit Risk- Measurement of operational and Technology Risk- Measurement of Foreign Exchange and Sovereign Risk- Measurement of Liquidity Risk- Measurement of Off Balance Sheet Risks.

UNIT3

Management of Risks: Risk Management Tools- Interest Rate Risk Management- Market Risk Management- Credit Risk Management- Operational Risk Management- Foreign Exchange and Sovereign Risk Management- Liquidity Risk Management- Management of Capital Adequacy- Risk Reporting

UNIT 4

Regulatory and Other Issues in Risk Management: Regulatory Frame Work- Revised RBI Risk Management Norms to Banks- Organizational Structure for Market and Credit Risk- SEBI, NHB- Bank for International Settlement- BASEL Committee on Banking Supervision- BASEL Settlement I,II & III- Calculation of Minimum Capital Requirements.

UNIT 5

Important Concepts of Risk Management: Time Value of Money- Advance Bond Concepts- Calculation of VaR- Balck-Scholes Model- Moody's KMV Portfolio Manager- Probability Distribution and Fundamentals of Statistics- Derivative Products and its Markets- Margin and Mark-to-Market.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

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1. Dr. G. Kotreshwar: "Risk Management", Himalaya Publishing House, Delhi. 2012

2. Trieschmann, Hoyt, Sommer: "Risk Management and Insurance", Cengage Learning. 2005,

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1. K Aswathappa: "***Human Resource and Personnel Management***", Tata McGraw Hill, New Delhi, 2013
2. N.Sambasiva Rao and Dr. Nirmal Kumar: "**Human Resource Management and Industrial Relations**", Himalaya Publishing House, Mumbai
3. Mathis, Jackson,Tripathy:"***Human Resource Management:Asouth-Asin Perspective***", Cengage Learning, New Delhi, 2013
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5. Madhurima Lall, Sakina Qasim Zasidi: "**Human Resource Management**", Excel Books, New Delhi, 2010

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Program Name: M.B.A Faculty Name:

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	IV	**Leadership** management	MB 164C	1-08-2017

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

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Course Context and Overview:

In commerce, Supply-Chain Management (SCM), the management of the flow of goods and services involves the movement and storage of raw materials, of work-in-process inventory, and of finished goods from point of origin to point of consumption. Interconnected or interlinked networks, channels and node businesses combine in the provision of products and services required by end customers in a supply chain. Supply-chain management has been defined as the "design, planning, execution, control, and monitoring of supply-chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand and measuring performance globally. SCM practice draws heavily from the areas of industrial engineering, systems engineering, operations management, logistics, procurement, information technology, and marketing and strives for an integrated approach.

Course Outcomes:

1.Analze the types of supply chain management,objectives of supply chain management, analysis of supply chain management and their constituents, supply chain activities, supply chain organization and managing technical challenges of supply chain.

2.Infer the purchasing issues in supply chain management,operations and distribution issues in supply chain management, facility location decision domestic and international transportation management and process management

3.Understand role of supply chain management CRM, tools and components of CRM,segmenting customers predicting customer behavior personalizing customer communications and customer service capabilities

4.Appreciate supply chain process integration,review and establish supply chain strategies,developing supply chain performance,integration of Key Process and Extending Process Integration in Second Tier Supply chain partners

5.Analze international supply chain management,international logistics infrastructure,methods of entry into foreign market,international contracts terms and trade of Incoterms, terms of payments and international commercial documents.

Course Objectives:

To analyze the manufacturing operations of a firm

2. To apply sales and operations planning, MRP and lean manufacturing concepts
3. To apply logistics and purchasing concepts to improve supply chain operations

4.To apply quality management tools for process improvement

5.To Understand International logistics infrastructure and methods of entry into Foreign Markets

SYLLABUS

UNIT 1:
Introduction to Supply Chain Management: Definition – Types of Supply Chain Management- Objectives of Supply Chain Management- Analysis of Supply Chain Management and their Constituents- Supply Chain Activities- Supply Chain Organization- Managing Technical Challenges of Supply Chain.
UNIT 2:
Supply Chain Management: An Overview: Purchasing Issues in Supply Chain Management- Operations and Distribution issues in Supply Chain

Management- Facility Location Decisions- Domestic and International Transportation Management- Process Management.

UNIT 3:

Customer Relationship Management: Introduction-Definition- Role of Supply Chain Management in CRM- Key Tools and components of CRM- Segmenting Customers- Predicting Customer Behavior- Personalizing Customer Communications- Customer Service Capabilities- Designing and Implementing Successful CRM.

UNIT 4:

Sustaining Competitive Advantage: Supply Chain Process Integration- Review and Establish Supply Chain Strategies- Developing Supply Chain Performance Measure and asses Internal Integration of Key Processes- Extend Process Integration to Second Tier Supply Chain Partners- Performance Measurement

UNIT 5:

International Supply Chain Management: Introduction of International SCM- International Logistics Infrastructure – Methods of entry into Foreign Markets- International Contracts- Terms and Trades or Incoterms- Terms of Payments- Currency of Payments and Managing Transaction Risk- International Commercial Documents.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Joel D. Wisner, G. Keong Leong, Keah-Choon Tan: Principles of Supply Chain Management, Cengage learning, New Delhi, 2009.

2. Sarika Kulkarni, Ashok Sharma: Supply Chain Management, Tata Mc Grawhill Education Private Limited, 2010.

3. David, Stewart: International Supply Chain Management, *Cengage* learning, New Delhi, 2007.

4. B. Raja Sekhar, GVRK Acharyulu: Logistics and Supply Chain Management, Excel Books, New Delhi, 2009

5. G. Raghuram, N. Rangaraj: Logistics and Supply Chain Management, Mac Millan Business Books, New Delhi 2000.

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Program Name: M.B.A Faculty Name:

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	IV	SERVICES MARKETING	MB 164D	

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
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PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
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Course Context and Overview:

Services marketing typically refers to both business to consumer (B2C) and business-to-business (B2B) services, and includes marketing of services such as telecommunications services, financial services, all types of hospitality, tourism leisure and entertainment services, car rental services, health care services and professional services and trade services. Service marketers often use an expanded marketing mix which consists of the seven Ps: product, price, place, promotion, people, physical evidence and process. A contemporary approach, known as *service-dominant logic*, argues that the demarcation between products and services that persisted throughout the 20th century was artificial and has obscured that everyone sells service.

Course Outcomes:

1. Analyze the sevices marketing environment,goods and services,components of services,service delivery of system,service facility design and layout ,HR and issues and building service aspirations
2. Infer the service environment,service blue printing,service encounter,customer expectation,demand supply chain management,service quality,service quality audit , bench markingTQM and customer satisfaction measurement techniques
3. Understand marketing marketing mix,developing package,product attractiveness,components of promotion mix,service strategy marketing and maintaining dialy relationship
4. Appreciate marketing of financial insurance services,technological relations,regulatory mechanism,managing of hospitality,travel and tourism products, segmentation and yield management
5. Infer marketing of health care,cellular and entertainment services,major hospital products and entertainment market mix emerging influence of retailing and shopping malls,liberalization of services and ITES

Course Objectives:

1. To understand the role of marketing in service organizations from new perspectives and a strategic vision
2. To analyze broadened marketing mix (services marketing mix) extends beyond the traditional boundaries.
3. To study the process of Managing the interface among customers, service employees, and firm.
4. To analyze Strategic issues of services marketing.
5. To understand meaning of service quality and its position in a service marketing strategy.

SYLLABUS

UNIT 1

Introduction to Services Marketing: Scope and Definition- Services Marketing Environment- Definition- Goods and Services- Components of Service- Characteristics- Service Delivery as a System- Service Facility Design and Layout- HRM Issues- -Building Services Aspirations- Tracking Customer Behavior-.

UNIT 2

Key Dimensions of Services Marketing: Introduction- Service Environment- Service Blue Printing- Service Encounter- Customer Expectations- Demand-Supply Management- Service Quality- Service Quality Gap- Service Quality

Audit-Delivering Quality Services-Communication Strategies- Bench Marking-TQM-Customer Satisfaction Measurement Techniques- MPQ-ROQ- Service Guarantees.

UNIT 3

Management of Services Marketing: Introduction- Marketing Mix-Developing a Package- Product Attractiveness- Components of Promotion Mix-Strategic Services Marketing- Service Target Segments- Positioning the Services- Creating and Maintaining Value Relationship- Market Leadership Strategies.

UNIT 4

Service Marketing Practices I: Marketing of Financial and Insurance Services- Major Characteristics- Technological Innovations- Regulatory Mechanism- Marketing of Hospitality, Travel and Tourism Products- Marketing for Travel and Tourism- Segmentation- Tourism Marketing Strategies- Yield Management- Services Delivery- Global Service Quality- Marketing of Educational, Software and other Professional Services.

UNIT 5

Service Marketing Practices II: Marketing of Health Care, Celluar and Entertainment Services-Health Care Marketing Strategy- Major Hospital Products- Cellular Promotion Mix- Entertainment Marketing Mix- Emerging Influence of Retailing and Shopping Malls- Internationalization of Services-Liberization of Services- Off shoring – ITES- Industry Structure- Business Models

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References

1. Dr. S. Shajahan: Services Marketing, Himalaya Publishing House, New Delhi 2009.

2. Rajendra Nargundkar: "Services Marketing", Tata McGraw Hill, New Delhi, 2011.

3. S.M. Jha: Service Management and Marketing, Himalaya Publishing House, New Delhi,2011

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Program Name: M.B.A   Faculty Name:

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	IV	TAX MANAGEMENT	MB 1645	

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
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Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to "Earn while they Learn" Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Tax management provides freeform creation of tax controls that will be applies to orders. Access tax management the 'tax management' link in the administration link list. Note that only administrators and order managers will have access to tax management.Any number of tax controls can be created. Each tax control has conditions and charges. If an order fits the conditions set in the tax rules, the order will be subject to the charges. If an order qualifies for more than one tax control, the order would be subject to the charges for all the qualifying tax controls. This flexibility is necessary, not only due to the variability of tax rates, but also the conditions changing and individual company tax perspective (Yes, we have seen companies with the same tax circumstances request different tax rules due to different advice from their individual tax attorneys). These tax controls give every organization the capacity to apply whatever tax decisions they wish

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Course Outcomes:

1.Understand basic concepts of agriculture income, residential status, income exemption from tax, income from house property, computation of salary income, income from business profession and capital gain from other sources

2. Analyze input from goods and services for CENVAT,Capital Goods for CENVAT,exempted final products, customs duty, scope and coverage of customs duty ,nature of customs duty and classification of customs.

3.Infer Nature of Tax, essential components in levy of tax, legal principles of taxation laws, Law Lexicon and Law Maxims, concepts of tax avoidance, tax evasion and tax planning and tax management.

4.Appreciate Tax Management Decision such make/buy-own/lease-export/local sale-gudelines to tax planning,concession,rebates,deductions,incentives(payments of advance tax) and filling of returns.

Course Objectives:

1. The course intends to equip students with knowledge and skills management of taxes and tax planning. The course will further be guided by the following objectives
2. The course intends to impart students with knowledge on taxable income determination and tax liability.
3. To analyze the processes of risk identification, risk measurement and risk management are explored.
4. The examine reputational risk and operational risk.

5. To analyze time value of money,advanced bond concepts,caluculation of VAR, Black-Scholes Model and Moody's KMV Portfolio Manager.

.**SYLLABUS**

UNIT 1

Direct and Indirect Taxes: Income Tax Act 1961 – Basic concepts – Income – Agricultural Income – Residential Status – Income exemption from tax – Income from House Property – Computation of Salary Income – Income from Business and Profession – Capital Gain from other sources – computation of Total Income. Indirect Taxes – Excise Duty – Introduction – Nature – Basic Concepts – Types and Taxable Event for Excise Duty.

UNIT 2

CENVAT : Input Goods and Services for CENVAT – Capital Goods for CENVAT – Exempted Final Products / Output Services – Customs Duty – Introduction – Basic Concepts – Scope and Converge of Customs Duty – Nature of Customs Duty – Classification for Customs – Types of Custom Duties – Exemptions from Customs Duty – Valuation for Customs Duty.

UNIT 3

Introduction to Tax Planning: Nature of Tax – Essential components in levy of tax – Legal Principles of taxation laws – Five basic Rules of interpretation of statues – Law Lexicon and Legal Maxims – Concepts of Tax Avoidance, Tax Evasion – Tax Planning and Tax Management.

UNIT 4

Tax Management Decisions: Tax considerations - Management Decisions, such as make / buy- own/lease - export/local sale - Guidelines to Tax planning – Relief's – Concessions – Rebates – Deductions – Incentives (Payment of Advance Tax) – Filing of Returns – Refunds – Penalties for non-compliance.

UNIT 5

Multi National Taxation: Bilateral Tax Treaties- Transfer Pricing for Tax Planning – Uses of Inter Company Loans- Tax Intensives Organizational Setup of MNCs- Tax Reliefs and Rebates in India- Tax Credits- Tax Havens- Investment Decision on Tax Planning- Global Investment and Tax Incentives- Transfer Pricing Methods- Measures to Plug Tax Loopholes.

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Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: M.B.A Faculty Name:

Class	Semester	Title of The Paper	Paper Code	W.E.F
MBA	I	Entrepreneurship development	MB 1640	12-07-2018

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
64	4	----	3 Hours	40	60	2

Programme Outcomes:

PO1.	**Management Knowledge:** This aims at imparting the knowledge of fundamentals of management theory and its applications. It enables the students to solve real world business problems through the use of team work, communication and critical thinking. This includes the knowledge of various management functional disciplines. Selected as knowledge of fundamentals of Accounting For Managers is essential in real world business situations.
PO2.	**Professional Skill Development:** This programme enhances the students to increase their professional leadership skills and effective communication skills. They will be able to possess the skills required to work and lead effectively in team based environment. This helps the students master a core set of management skills in various disciplines so as to enable them to integrate and apply this knowledge to develop effective solutions to complex multidisciplinary business problems. Selected as knowledge of professionals skills development is essential for the future management graduates.
PO3.	**Solve Business Problems Effectively:** Formulate business applications to solve critical decision making problems for case analysis and field study. It will help the students to get a real world exposure of corporate business scenario and includes effective problem solving and decision-making skills and to evaluate ill-defined management problems and issues. Selected as knowledge of case anlaysis is essential in Accounting For Managers.
PO4.	**Gaining Experiential Knowledge Through Team Work :** Students gain experiential knowledge about the challenges and modern practices of contemporary business developments needed effectively to assess business problems and different community partners. Students can use their managerial and professional knowledge to effectively work in interdisciplinary teams.

	This is essential for success in their future business careers Selected as experiential knowledge and team work will enable the business graduates real world situations.
PO5.	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment

Programme Specific Outcomes:

PSO1	**Opportunity for Lifelong Education:** Students can get an opportunity for lifelong learning in professional skills by updating their knowledge continuously. Industrial tours, field studies and surveys are part of the programme. Selected as Management graduates are expected to be life long learners
PSO2	**Internships:** Students are encouraged to get live exposure on internships at reputed organisations. These internships help the students to work better in their future business endeavors. This programme will prepare the students to take on challenging roles as professionals in the context of globalization and de-regulation. This offers the students an opportunity to “Earn while they Learn” Selected as Internships enable the students to earn while they learn so that they can finance their education.
PSO3	**Generation of Industry Ready Graduates:** This programme is meant to produce graduates ready for taking jobs in modern corporate business organizations. Students are encouraged to acquire the needed skills for this purpose. This will enable the students to have judicious mix of theoretical and cutting edge practical skills so that they become effective and productive on the job. Selected as the generation of Industry ready Graduates is the essence of Management Education

Course Context and Overview:

Entrepreneurship development is the process of improving the skills and knowledge of entrepreneurs through various training and classroom programs. The whole point of entrepreneurship development is to increase the number of entrepreneurs.By doing this, the pace at which new businesses or ventures are made gets better. On a wider level, this makes room for employment and improves the economy of a business or country. The steps below will explain how to create an effective entrepreneurship development program and how to go about enhancing it

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Course Outcomes:

1. Infer the Importance and growth - Characteristics and Qualities of Entrepreneur- Role of Entrepreneurship, Ethics and Social Responsibilities. Women Entrepreneurship: Role & Importance and Problems of Women Entrepreneurs
2. Understand the designing Appropriate Training Programme to inculcate Entrepreneurial Spirit, Training for New and Existing Entrepreneurs, Feedback and Performance of Trainees and Creativity and Entrepreneurship
3. Appreciate the growth of Firm, Project identification and selection -Factors inducing growth ,Project Feasibility Study , Post Planning of Project-Project Planning and Control
4. Analyze the Small and Micro Enterprises: Importance, definitions – policies and their support to MSMEs -growth and growth strategies – sickness in small business and remedies – small entrepreneurs in International business
5. Understand the Role of Government - Role of IDBI, NIESBUD, SISI, DIC - Financial Institutions-Commercial Banks, Entrepreneurial Development Institutes, Universities and other Educational Institutions offering Entrepreneurial Development Programme

Course Objectives:

1. Creates a pre-understanding and a foundation for which the students can be tested in theoretical insight
2. Teaching the students to understand and apply the I&E – methods and tools
3. Learning through practice.
4. The students solve a specific innovation challenge and apply their knowledge into actual action that creates value for others
5. developed advanced knowledge on how to assess business opportunities and an in-depth understanding of what typically characterize successes and failures

syllabus

ENTREPRENEURSHIP DEVELOPMENT

UNIT 1
Entrepreneurship: Importance and growth - Characteristics and Qualities of Entrepreneur- Role of Entrepreneurship, Ethics and Social Responsibilities. Women Entrepreneurship: Role & Importance, Problems of Women Entrepreneurs – corporate entrepreneurship – mobility of entrepreneur – entrepreneurial motivation.

UNIT 2
Training: Designing Appropriate Training Programme to inculcate Entrepreneurial Spirit -Training for New and Existing Entrepreneurs, Feedback and Performance of Trainees. Creativity and Entrepreneurship: Sources and Methods of Ideas Planning and Development of Programmes

UNIT 3

Planning and Evaluation of Projects: Growth of Firm – Project identification and selection -Factors inducing growth- - Project Feasibility Study - Post Planning of Project- Project Planning and Control.

UNIT 4

Small and Micro Enterprises: Importance, definitions – policies and their support to MSMEs -growth and growth strategies – sickness in small business and remedies – small entrepreneurs in International business.

UNIT 5

Institutional Support to Entrepreneur and MSMEs: Role of Government - Role of IDBI, NIESBUD, SISI, DIC - Financial Institutions-Commercial Banks, Entrepreneurial Development Institutes, Universities and other Educational Institutions offering Entrepreneurial Development Programme.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Arya Kumar: "Entrepreneurship", Pearson, Publishing House, New Delhi,
2012. 2. VSP Rao, Kuratko: "Entrepreneurship', Cengage Learning, New
Delhi,
3. K.Ramachandran: "Entrepreneurship Development", TMH, New Delhi, 2012
4.B.Janakiram, M Rizwana: "Entrepreneurship Development" Excel Books, New Delhi,
2011 5.Rajeev Roy: "Entrepreneurship", Oxford University Press, New Delhi,2012
6. P.C.Shejwalkar: "Entrepreneurship Development", Everest Publishing House, New Delhi, 2011

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Program Name: DIPLOMA Faculty Name:G.SIRISHA

Class	Semester	Name of the Subject	Subject Code	W.E.F
I DCE	1	ENGLISH	C-101	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory 3	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

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7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Civil Engineering Diploma Students acquire structural and managerial skill that make them an employable graduate.

PSO 2: The Civil Engineering Diploma Students acquire planning background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1. Understand the basic fundamentals of language abilities.

2. To learn the listening, speaking, reading and writing for learning technical subjects.

Course Outcomes:

CO1 : Understand the build the vocabulary in the direction of future needs.

CO2: Understand the framing of different grammatical structures.

CO3 : Understand the read and comprehend the details.

CO4 : Develop the various forms of written communication.

CO5: Understand the writing composition and data interpretation.

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CO6: Understand the spoken communication suited to various situtation.

COURSE CONTENT

1.0 Extend their vocabulary in the direction of their future needs

1.1 Locate words, learn spellings, understand meanings

1.2 Pronounce words intelligibly

1.3 Find synonyms and antonyms

1.4 Use affixation

1.5 Comprehend meanings of words by understanding meanings of roots

2.0 Learn various grammatical structures

2.1 Identify and use nouns

2.2 Identify and use pronouns

2.3 Use the present tense

2.4 Use the past tense

2.5 Use the future tense

2.6 Identify and use adjectives

2.7 Identify and use adverbs

2.8 Use prepositions

2.9 Use linkers

2.10 State basic sentence structures

2.11 Construct different types of sentences

2.12 Frame questions to elicit information

2.13 Frame questions for confirmation
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2.14 Use active voice

2.15 Use passive voice

2.16 Use direct speech

2.17 Use indirect speech

2.18 Identify and correct errors

3.0 Read and comprehend English

3.1 Identify the main ideas

3.2 Identify the specific details

3.3 Draw inferences

3.4 Give contextual meanings of the words

3.5 Perceive tone in a text

4.0 Learn to excel in various forms of written communication (writing composition and data interpretation)

4.1 Identify components of a good paragraph

4.2 Write types of paragraphs

4.3 Distinguish between formal and informal letters

4.4 Write personal letters

4.5 Write leave letters

4.6 Write official letters

4.7 Write letters of complaints

4.8 Prepare a resume

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4.9 Write a cover letter

4.10 Write short messages

4.11 Report incidents

4.12 Report experiments

4.13 Report Industrial visits

4.14 Write work done statements

4.15 Write maintenance reports

4.16 Make notes using Cue method and Mapping method

4.17 Summarize Paragraphs

4.18 Present and Interpret Data from flow charts, tree diagrams, bar graphs, tables, pie charts

Practice spoken communication suited to various situations.

4.19 Use appropriate expressions to greet and take leave

4.20 Use proper expressions to make requests

4.21 Use apt expressions for asking and giving directions

4.22 Use suitable expressions to seek and offer suggestions

4.23 Use suitable expressions to state intentions

4.24 Use suitable expressions to state feelings

4.25 Use appropriate expressions to state agreement and disagreement

4.26 Use proper expressions to make complaints

4.27 Use suitable expressions to express obligations

Course Material

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The textbook prepared by the faculty of English of Polytechnics in AP.

Reference Books

1. Essential English Grammar (Intermediate Level) Raymond Murphy

2. Learn English (A Fun Book of Functional Language, Santanu Sinha Chaudhuri

Grammar and Vocabulary)

3. Grammar Builder (Entire Series) Oxford University Press

4. High School English Grammar (Revised Edition) Wren and Martin

5. Sentence skills with Readings John Langan, Paul Langan

(fourth Edition, Tata McGraw Hill)

6. Word Power Made Easy Norman Lewis

7. Spoken English Shashi Kumar and Dhamija

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Program Name: DIPLOMA   Faculty Name: E.SUNDESH BABU

Class	Semester	Name of the Subject	Subject Code	W.E.F
I DCE	I	Engineering Mathematics	C-102	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
150 Hours	Theory 5	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Civil Engineering such as Basic knowledge of Calculus.
PSO2	Enabling students to understand the concept of Trigonometry & Algebra and it's applications and to be effective in professional practice of Civil Engineering.

Course Objectives:

1. The students completing this course are expected to understand the concepts of Algebra and Trigonometry.

2.They are required to understand the concepts of Differential Calculus & Application of Differentiation.

Course Outcomes:

CO1:Basic knowledge of Use Matrices & Logarithms for solving engineering problems

CO2:Using the basic knowledge of In descent Mathematics.

CO3:Using Concepts of differential Calculus.

CO4:Using properties of Conics in engineering applications.

CO5:Applying Real life applications.

COURSE CONTENT

1. Algebra

a) Use Logarithms in engineering calculations.Define logarithm and list its properties.Distinguish natural logarithms and common logarithms.Explain the meaning of e and exponential function.State logarithm as a function and its graphical representation.Use the logarithms in engineering calculations.Resolve Rational Fraction into sum of Partial Fractions in engineering problems.Define the fractions of polynomials
Explain the procedure of resolving rational fractions of the type mentioned below into partial fractions
Use Matrices for solving engineering problems.Define a matrix and order of a matrix.State various types of matrices with examples (upto 3rd order square matrices).Define the transpose of a matrix and write its properties. Define symmetric and skew-symmetric matrices.
b) Resolve a square matrix into a sum of symmetric and skew- symmetric matrices with examples in all cases. Define minor, co-factor of an element of 2X2 and 3x3 square matrices with examples.Define multiplicative inverse of a matrix and list properties of adjoint and inverse. Compute adjoint and ultiplicative inverse of a square matrix.Representation of system of linear equations (2 variables in 2 equations and 3 variables in 3 equations) in matrix form. Solve system of linear equations using Cramer's rule.Solve system of linear equations by matrix inversion method, State elementary row operations.Solve a system of linear equations by Gauss- Jordan method.

2. Trigonometry

a) Define trigonometric ratios of any angle. List the values of trigonometric ratios at specified values.Draw graphs of trigonometric functions. Explain periodicity of trigonometric functions.Define compound angles and state the formulae of sin(A±B), cos(A±B), tan(A±B) and cot(A±B).Give simple examples on compound angles to derive the values of $\sin 15^0$, $\cos 15^0$,$\sin 75^0$, $\cos 75^0$, $\tan 15^0$, $\tan 75^0$ etc.Derive identities like sin (A+B) sin(A-B) = $\sin^2 A - \sin^2 B$ etc., Solve simple problems on compound angles.Derive the formulae of multiple angles 2A, 3A etc and sub multiple angles A/2 in terms of angle A of trigonometric functions.Derive useful allied formulas like sinA= (1- cos2A)/2 etc.,Derive the formulae on transforming sum or difference of two trigonometric ratios in to a product and vice versa- examples on these formulae.Explain the concept of the inverse of a trigonometric function by selecting an appropriate domain and range. Define inverses of six trigonometric functions along with their domains and ranges.Derive relations between inverse trigonometric functions so that given A= $\sin^{-1}x$, express angle A in terms of other inverse trigonometric functions - with

examples. State various properties of inverse trigonometric functions and identities like $\sin^{-1}x+\cos^{-1}x = \pi/2$ etc.
b) Explain what is meant by solutions of trigonometric equations and find the general solutions of sin x=k, cos x =k and tan x=k with appropriate examples. Solve models of the type a $\sin^2 x$ + b sin x +c=0, a cos x + b sin x=c etc., and problems using simple transformations.State sine rule, cosine rule, tangent rule and projection rule. Explain the formulae for sin A/2, cos A/2, tan A/2 and cot A/2 in terms of semi perimeter and sides a, b, c .List various formulae for the area of a triangle. Solve problems using the above formulae. Solve a triangle when (i) three sides, (ii) two sides and an included angle, (iii) two sides and an opposite angle-case of two solutions and (iv) one side and two angles are given.Define Sinh x, cosh x and tanh x and list the hyperbolic identities Represent inverse hyperbolic functions in terms of logarithms.
Define complex number, its modulus , conjugate and list their properties. Define the operations on complex numbers with examples.Define amplitude of a complex number. Represent the complex number in various forms like modulus-amplitude (polar) form, Exponential (Euler) form – illustrate with examples.State DeMoivre's theorem and its applications to complex numbers e.g., finding the roots, powers, simplifications of a complex number with illustrative examples.

3. Co-ordinate Geometry

a) Write the different forms of a straight line – point slope form, two point form, intercept form, normal form and general form.Solve simple problems on the above forms Find distance of a point from a line, acute angle between two lines, intersection of two non-parallel lines and distance between two parallel lines.Define locus of a point – circle and its equation.
b) Find the equation of a circle given (i) Center and radius (ii) Two ends of a diameter (iii) Centre and a point on the circumference (iv) Three non collinear points.Write the general equation of a circle and find the centre and radius.Define a conic section. Explain the terms focus, directrix, eccentricity, axes and latus rectum of a conic with illustrations.Find the equation of a conic when focus, directrix and eccentricity are given Describe the properties of Parabola, Ellipse and Hyperbola in standard form.

4. Differential Calculus

a) Mention the Standard limits.Solve the problems using the above standard limits Evaluate the limits of the type.Explain the concept of continuity of a function at a point and on an interval with some examples whether a given function is continuous or not.State the concept of derivative of a function y = f(x) – definition, first principle.State the significance of derivative in scientific and engineering applications. Find the derivatives of elementary functions like xn , ax, ex, log x, sin x, cos x, tanx, Secx, Cosecx and Cot x using the first principles.Find the derivatives of simple functions from the first principle. State the rules of differentiation of sum, difference, scalar multiplication, product and quotient of functions with illustrative and simple examples.Explain the method of differentiation of a function of a function (Chain rule) with illustrative examples.
b) Find the derivatives of Inverse Trigonometric functions and examples using the Trigonometric transformations.Explain the method of differentiation of a function with respect to another function and also differentiation of parametric functions with examples. Find the derivatives of hyperbolic functions.Explain the procedures for finding the derivatives of implicit function with examples. Explain the need of taking logarithms for differentiating some functions with examples like $[f(x)]^{g(x)}$.Explain the concept of finding the higher order derivatives of second and third order with examples. Explain the concept of functions of several variables, partial derivatives and difference between the ordinary and partial derivatives with simple examples.Explain the definition of Homogeneous function of degree n Explain Euler's theorem for homogeneous functions with applications to simple problems.

5. Applications of Differentiation

a) State the geometrical meaning of the derivative as the slope of the tangent to the curve y=f(x) at any point on the curve.Explain the concept of derivative to find the slope of tangent and to find the equation of tangent and normal to the curve y=f(x) at any point on it.Find the lengths of tangent, normal, sub-tangent and sub normal at any point on the curve y=f(x).Explain the concept of angle between two curves and procedure for finding the angle between two given curves with illustrative examples.Explain the derivative as a rate of change in distance-time relations to find the velocity and acceleration of a moving particle with examples.Explain the derivative as a rate measure in the problems where the quantities like volumes, areas vary with respect to time- illustrative examples.
b) Define the concept of increasing and decreasing functions.Explain the conditions to find points where the given function is increasing or decreasing with illustrative examples.Explain the procedure to find the extreme values (maxima or minima) of a function of single variable - simple problems yielding maxima and

minima.Solve problems on maxima and minima in applications like finding areas, volumes, etc.Find the absolute error, approximate error, relative error and percentage error in functions of single variable.

REFERENCE BOOKS

1. A text book of matrices by Shanti Narayan,
2. Plane Trigonometry, by S.L. Loney
3. Co-ordinate Geometry. by S.L. Loney
4. Thomas Calculus. Pearson Addison-Wesley publishers
5. Calculus - I, by Shanti Narayan and Manicavachgam Pillai, S.V Publications

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Program Name: DIPLOMA Faculty Name: P.NARESH

Class	Semester	Name of the Subject	Subject Code	W.E.F
I DCE	Year end	Engineering Physics	C-103	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
	Theory	Practical		Internal	External
120 Hours	4		3	20	80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Civil Engineering such as Basic knowledge of Calculus.
PSO2	Enabling students to understand the concept of different sectors in diploma to uplift their technical levels.

Course Objectives:

1. The students completing this course are expected to understand the concepts of Engineering physics and its applications.

2. The student will able to work n any field with the basic knowledge of physics.

Course Outcomes:

1. Understanding the concepts of units and dimensions and vectors.
2. Understanding the concepts of kinematics and friction.
3. Understanding the concepts of work, power energy& SHM.
4. Understanding the concepts Heat & Laws of thermodynamics.
5. Understanding the concepts of Properties of Matter, Electricity and Magnetism.
6. Understanding the concepts of Modern physics.

COURSE CONTENT

1. Units and Dimensions:
Introduction – Physical quantity – Fundamental and Derived quantities – Fundamental and Derived units- SI units –Multiples and Sub multiples – Rules for writing S.I. units-Advantages of SI units – Dimensions and Dimensional formulae- Dimensional constants and Dimensionless quantities- Principle of Homogeneity- Advantages and limitations of Dimensional analysis- - Problems.

2. Elements of Vectors:
Scalars and Vectors –Types of vectors(Proper Vector, Null Vector, Unit Vector, Equal , Negative Vector, Like Vectors, Co-Initial Vectors, Co-planar Vectors and Position Vector).Addition of vectors- Representation of vectors- Resolution of vectors - Parallelogram, Triangle and Polygon laws of vectors–Subtraction of vectors- Dot and Cross products of vectors-Problems

3. Kinematics
Introduction- Concept of acceleration due to gravity- Equations of motion for a freely falling body and for a body thrown up vertically- Projectiles- Horizontal and Oblique projections- Expressions for maximum height, time of flight, range - problems

4. Friction:
Introduction to friction- Causes- Types of friction- Laws of friction- Angle of repose-Angle of friction— Motion of a body over a horizontal surface- smooth inclined plane- rough inclined plane- Advantages and disadvantages of friction- Methods of reducing friction – Problems

5. Work, Power and Energy:
Work, Power and Energy- Definitions and explanation- potential energy- kinetic energy- Derivations of Potential and Kinetic energies-K.E and Momentum relation - Work-Energy theorem- Law of Conservation of energy- Problems

6. Simple Harmonic Motion:
Introduction- Conditions of SHM- Definition- Examples- Expressions for displacement, velocity, acceleration, Time period, frequency and phase in SHM- Time period of a simple pendulum- Laws of simple pendulum-seconds pendulum- Problems

7. Heat and Thermodynamics:
Expansion of Gases- Boyle‘s law- Absolute scale of temperature- Charles laws- Ideal gas equation- Universal gas constant- Differences between r and R- Isothermal and adiabatic processes- Laws of thermodynamics- Specific heats - molar specific heats of a gas –Derivation

of Mayer's Equation- Problems

8. Sound:

Sound- Nature of sound- Types of wave motion -musical sound and noise- Noise pollution – Causes & effects- Methods of reducing noise pollution- Beats- Doppler effect- Echo-Reverberation-Reverberation time-Sabine _s formula-Conditions of good auditorium-Problems

9. **Properties of matter**

Definition of Elasticity –Definition of stress and strain -the uni t s and dimens ional formulae for s t res s and s t rain -The Hooke's law- Definition of surface tension-Explanation of Surface tension with reference to molecular theory - Definition of angle of contact - Definition of capillarity -The formula for surface tension based on capillarity - Explanation of concept of Viscosity - Examples for surface tension and Viscosity - Newton's formula for viscous force-Definition of co-efficient of viscosity- The effect of temperature on viscosity of liquids and gases - Poiseuille's equation for Co-efficient of viscosity- Th e r e la t e d n ume r i c a l problems

10. Electricity & Magnetism:

Ohm's law and explanation- Specific resistance- Kirchoff 's laws- Wheatstone's bridge - Meter bridge- Coulomb's inverse square law magnetic field- magnetic lines of force-Magnetic induction field strength- magnetic induction field strength at a point on the axial line - magnetic induction field strength at a point on the equatorial line –problems.

11. Modern Physics;

Photoelectric effect –Einstein's photoelectric equation-laws of photoelectric effect - photoelectric cell –Applications of photo electric effect- Total internal reflection- fiber optics- -principle and working of an optical fiber-types of optical fibers - Applications of optical fiberssuperconductivity - applications

REFERENCE BOOKS

1. Intermediate physics Volume-I & 2 Telugu Academy (English version)
2. Unified physics Volume 1,2,3 and 4 Dr.S.L Guptha and Sanjeev Guptha
3. Text book of physics Volume I Resnick & Holiday
4. Text book of applied physics Dhanpath Roy
5. Fibre optics D.A Hill
6. NCERT Text Books XI & XII Standard.

Signature of faculty. **Signature of Principal**

P.Naresh.

College of Engineering & Technology,
Kothapet, VIJAYAWADA-520 001

College of Engineering & Technology,
Kothapet, VIJAYAWADA-520 001

Program Name: DIPLOMA Faculty Name:B. ANIL KUMAR

Class	Year	Title of The Paper	Paper Code	W.E.F
I DCE	I	ENGINEERING CHEMISTRY AND ENVIRONMENTAL SUTDIES	C 104	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
120 Hours	Theory 4	Practical	3	Internal 20	External 80	

Programme Outcomes:

	Program Outcome
PO1.	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
Selected as application of knowledge of mathematics and science is involved in calculating troubles using advanced materials as engineering materials.	
PO2.	**Problem analysis**: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Selected as students can identify and analyze the problems of corrosion and can adopt new methods to overcome corrosion	
PO3.	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
Selected as the student can develop and construct the fuel cells and batteries.	

PO4.	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
Selected as students are required to do experiments using electronic devices like conductometers, potentiometers.	
PO5.	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
selected as students learn the usage of modern tools and techniques for complex engineering materials like nanomaterials , liquid crystals, polymers.	
PO6.	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
selected as ,by the contextual knowledge of green chemistry, fuels etc student can assess societal, health and safety issues	
PO7.	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
Selected as the course address issues related to environment and sustainability.	
PO8.	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
selected as the course address ethical issues related to minimizing the usage of hazardous chemicals and promotes green chemistry.	
PO9.	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
Not selected as the course does not related.	
PO10.	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
Not Selected as the course does not address complex engineering activities with the engineering community.	
PO11.	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
Selected as students can understand how to manage projects in multidisciplinary environment	
PO12.	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of

	technological change.
selected as student can recognize the need for life-long learning in the context of technological change.	
PSO 1	Knowledge of contemporary issues in the civil engineering industry to solve societal issues
Selected as the course addresses, advanced materials to solve societal issues	
PSO 2	To qualify in competitive examinations for higher education and employment
selected as the course addresses, basics for higher education and employment**.**	

Course Objectives:

- Plastics are nowadays used in household appliances; also they are used as composites (FRP) in aerospace and automotive industries.
- Fuels as a source of energy are a basic need of any industry, particularly industries like thermal power stations, steel industry, fertilizer industry etc., and hence they are introduced.
- The basics for the construction of galvanic cells are introduced. Also if corrosion is to be controlled, one has to understand the mechanism of corrosion which itself is explained by electrochemical theory.
- With the increase in demand, a wide variety of materials are coming up; some of them have excellent engineering properties and a few of these materials are introduced.
- Water is a basic material in almost all the industries, more so where steam is generated and also where it is supplied for drinking purposes.
- Materials used in major industries like steel industry, metallurgical industries and construction industries and electrical equipment manufacturing industries are introduced. Also lubrication is introduced

Course Outcomes:

	Course Outcome	POs/ PSOs	CL (Cognitive level)	Class Sessions taken
CO1	**Develop the** knowledge of basic construction materials with its vital role by evaluating utility of polymers in chemical and hardware industries.	PO1, PO2, PO3, PO4, PO5, PO8,PO11, PO12,PSO 1,PSO2	EV	20
CO2	Devolop the basic knowledge regarding metals,Extrapolate the application of fuels in day to day life and to understand energy – related problems and solve them,	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8,PO11, PO12 PSO1,PSO 2	AP	18
CO3	Extrapolate the knowledge of galvanic cell, reference electrode and batteries in chemical and other engineering areas. Develop corrosion protection methods by	PO1, PO2, PO4, PO5, PO8,PO11, PO12, PSO1,PSO 2	EV	25

	evaluating different factors influencing corrosion			
CO4	Explore the engineering applications to environment like air pollution, water pollution	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO11, P PO8,O12, PS01,PSO2	AP	23
CO5	Appraise the quality and utility of suitable water for industrial as well as domestic applications.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8,PO11, PO12, PSO1,PSO 2	EV	14
CO6	Explore the engineering applications of various solutions, acids and bases	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO11, PO12, PSO1, PSO2	AP	20
Total Hours of instruction				120

UNIT I: FUNDAMENTALS OF CHEMISTRY

1.1 Explain the charge and mass of fundamental particles of an atom (electron, proton and neutron)

1.2 Explain the concept to f atomic number and mass number.

1.3 State the Postulates of Bohr's atomic theory and its limitations.

1.4 Explain t he sig nif icance of f our Quantum numbers.

1.5 Explain 1 . Aufbau principle, 2 Pauli's exclusion principle 3 Hund's rule.

1.6 Define Orbital in an atom.

1.7 Draw the shapes of s p and d - Orbitals .

1.8 Distinguish between Orbit and Orbital

1.9 Write the electronic configuration of elements up to atomic number 30

1.10 Explain the significance of chemical bonding

1.11 Explain the Postulates of Electronic theory of valency

1.12 Define the types of Chemical bonding viz., Ionic, Covalent bonds.

1.13 Explain the types of Chemical bonding viz., Ionic, Covalent bonds with examples.

1.14 Explain bond formation in NaCl and MgO.

1.15 List Properties of Ionic compounds

1.16 Explain bond formation in Hydrogen molecule, Oxygen molecule, and Nitrogen molecule using Lewis dot method.

1.17 List Properties of Covalent compounds

1.18 Distinguish between properties of ionic compounds and covalent compounds.

1.19 Structures of ionic solids-define a) Unit cell b) co-ordination number.

1.20 Structures of Unit cells of NaCl and CsCl.

1.21 Define the term. Oxidation number.

1.22 Calculate the Oxidation Number of underlined atoms in the following examples

a)$K\underline{Mn}O_4$ b) $K_2\underline{Cr}_2O_7$ c) $H\underline{N}O_3$ d) $H_2\underline{S}O_4$ e) $\underline{Cl}O_4^-$ f) $\underline{N}H_4^+$

1.23 Differentiate between Oxidation Number and Valency

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UNIT II: SOLUTIONS

2.0 Calculate Molarity and Normality of given Solution

2.1 Define the terms 1. Solution, 2. Solute and 3. Solvent

2.2 Classify solutions based on physical state and solubility

2.3 Define mole

2. 4 Problems on 'Mole concept'

2.5 Define the terms 1. Atomic weight, 2.Molecular weight and 3. Equivalent weight

2.6 Calculate Molecular weight and Equivalent weight of given Acids,(HCl,$H_2SO_4$$HNO_3$)Bases ($NaOH$, KOH, $Ca(OH)_2$) and Salts ($NaCl$, Na_2CO_3, $CaCO_3$)

2.7 Define 1.Molarity, 2.Normality of solutions

2.8 Solve Numerical problem son Molarity and Normality

a) calculate the Molarity or Normality if weight of solute and volume of solution are given

b) calculate the weight of solute if Molarity or normality with volume of solution are given

c) problems on dilution to convert high concentrated solutions to low concentrated solutions

UNIT III: ACIDS AND BASES

3.0 Understand the concepts of Acids and bases

3.1 Explain Arrhenius theory of Acids and Bases

2 State the limitations of Arrhenius theory of Acids and Bases

3 Explain Bronsted – Lowry theory of acids bases

3.4 State the limitations of Bronsted – Lowry theory of acids bases

5 Explain Lewis theory of acids and bases

3.6 State the limitations of Lewis theory of acids and bases

7 Explain the Ionic product of water

8 Define pH and explain Sorenson's scale

3.9 Solve the Numerical problems on pH(Strong Acids and Bases)

3.10 Define Buffer solution

3.11 Give at least three examples for Buffer solutions

3.12 State the applications of Buffer solution

3.9 Solve the Numerical problems on pH(Strong Acids and Bases)

3.10 Define Buffer solution

3.11 Give at least three examples for Buffer solutions

3.12 State the applications of Buffer solution

UNIT IV: PRINCIPLES OF METALLURGY

4.0 Understand the Principles of Metallurgy

4.1 List at least eight Characteristics of Metals

4.2 Distinguish between Metals and Non Metals

4.3 Define the terms 1.Mineral, 2.Ore, 3. Gangue, 4.Fluxand 5.Slag

4.4 Describe the methods of concentration of Ore; 1.Handpicking,2.Levigation, and 3. Froth Floatation

4.5 Describe the methods involved in extraction of crude metal- Roasting, Calcination and Smelting.

4.6 Explain the purification of Metals by Electrolytic Refining

4.7 Define an Alloy

4.8 Write the Composition of the following alloys :1.Brass, 2 . Germansilver, 3 Nichrome

4.9 L i s t t h e uses of the following Alloys: 1. Brass, 2.Germansilver, 3.Nichrome

UNIT V: ELECTROCHEMISTRY

5.0 Understand the concepts of Electrochemistry

5.1 Define the terms1. Conductor, 2. Insulator, 3.Electrolyte 4.Non–electrolyte

5.2 Distinguish between metallic conduction and Electrolytic conduction

5.3 Explain electrolysis by taking example fused NaCl

5.4 Explain Faraday's laws of electrolysis

5.5 Define 1 . Chemical equivalent (E) 2 . Electrochemical equivalent (e) and their relation.

5.6 Solve the Numerical problems based on Faraday's laws of electrolysis

5.7 Define Galvanic cell

8 Explain the construction and working of Galvanic cell

9 Distinguish between electrolytic cell and galvanic cell

10 Explain the electrode potentials and standard electrode potentials

11 Explain the electro chemical series and its significance

12 Explain the emf of a cell.

13 Solve the numerical problems on emf of a the cell based on standard electrode potentials.

UNIT VI: CORROSION

Understand the concept of Corrosion

6.1 Define The term corrosion

6.2 state the Factors influencing the rate of corrosion

6.3 Describe the formation of a)composition cell, b)stress cell ,c) concentration cell during corrosion.

6.4 Define rusting of iron and Explain the mechanism of rusting of iron.

6.5 Explain the methods of prevention of corrosion:

a)Protective coatings (anodic and cathodic coaitings)

Cathodic protection(Sacrificial anode process and Impressed–voltage process)

6.1 Define The term corrosion

6.2 state the Factors influencing the rate of corrosion

6.3 Describe the formation of a)composition cell, b)stress cell ,c) concentration cell during corrosion.

6.4 Define rusting of iron and Explain the mechanism of rusting of iron.

6.5 Explain the methods of prevention of corrosion:

a)Protective coatings (anodic and cathodic coaitings)

Cathodic protection(Sacrificial anode process and Impressed–voltage process)

UNIT VII: WATER TECHNOLOGY

7. 0 Understand the concept of Water Technology

7.1 State the various Sources of water like Surface water and sub-surface water.

7.2 Define the terms soft water and hard water with respect to soap consumption.

7.3 Define the term hardness o f w a t e r

7.4 Types of hardness of water 1.Temporary hardness 2.Permanent hardness

7.5 List the salts that causing hardness of water(with Formulae)

7.6 State the disadvantages of using hard water in industries

7.7 Define Degree of hardness, units of hardness(mg/L) or ppm.

7.8 Explain the methods of softening of hard water:a) Ion-Exchange process, b)Permutit process or zeolite process

7.9 Concept of Osmosis and Reverse Osmosis with examples .

7.10 State the applications of Reverse Osmosis.

7.11 State essential qualities of drinking water.

UNIT VIII: POLYMERS

8.0 Understand the concepts of Polymers

8.1 Explain the concept of polymerisation

8.2 Describe the methods of polymerization a) addition polymerization of Ethylene b)condensation polymerization of phenol and formaldehyde(Only flow chart i.e. without chemical equations)

8.3 Define the term plastic

8.4 Classify the plastics with examples

8.5 Distinguish between thermo and thermo setting plastics

8.6 List the Characteristics of plastics

8.7 State the advantages of plastics over traditional materials

8.8 State the disadvantages of using plastics.

8.9 Explain the methods of preparation of the following plastics:

1.Polythene, 2. PVC, 3.Teflon, 4. Polystyrene and 5. Urea formaldehyde

8.10 Explain the uses of the following plastics:

1.Polythene, 2. PVC, 3.Teflon, 4.Polystyrene and 5. Urea formaldehyde

8.11 Define the term natural rubber

8.12 write the structural formula of Natural rubber

8.13 Explain the processing of Natural rubber from latex

8.14 List the Characteristics of natural rubber

8.15 Explain the process of Vulcanization

8.16 List the Characteristics of Vulcanized rubber

8.17 Define the term Elastomer

8.18 Describe the preparation of the following synthetic rubbers a) Buna-s and b)Neo prene rubber

8.19 List the uses of the following synthetic rubbers a) Buna-s and b)Neo prene rubber

UNIT IX: FUELS

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9.0 Understand the concepts of Fuels

9.1 Define the term fuel

9.2 Classify the fuels based on physical state–solid, liquid and gaseous fuels,

9. 3 Classify the fuels based on occurrence-primary and secondary fuels

9.4 List the characteristics of good fuel

9.5 State the composition and uses of gaseous fuels:

a)water gas, b)producer gas, c)natural gas, d)coal gas, e)Biogas and f) acetylene

B.ENVIRONMENTALSTUDIES

1.1 Define the term environment

1.2 Explain the scope and importance of environmental studies

1.3 Segments of environment 1).Lithosphere, 2).Hydrosphere, 3).Atmosphere,

4).Biosphere,

1.4 Define the following terms 1)Pollutant, 2).Pollution, 3).Contaminant, 4)receptor, 5)sink, 6) particulates, 7)dissolved oxygen, 8)Threshold limit value, 9).BOD, and 10).COD 11) eco system .

1.5 State the renewable and non renewable energy sources with examples.

1.6 Define t h e t e r m s :

1) . Producers, 2) . Consumers and 3) . Decomposers with examples.

1.7 Explain bio diversity and threats and biodiversity

1.8 Define air pollution

1.9 Classify the air pollutants-based on origin and physical state of matter.

1.10 Explain the causes of Air pollution.

1.11 Explain the effects of air pollution on human beings, plants and animals.

1.12 State the uses of forest resources.

1.13 State the deforestation and its causes and effects.

1.14 Explain the 1.) Green house effect , 2) Ozone layer depletion and 3) Acidrain.

1.15 Explain the methods of control of Air pollution

1.16 Define Water pollution

1.17 Explain the causes of Water pollution

1.18 Explain the effects of Water pollution on living and Non-living things.

1.19 Explain the methods of control of Water pollution.

CO	PO 1 (K3)	PO 2 (K4)	PO 3 (K6)	PO 4 (K6)	PO 5 (K6)	PO 6 (K6)	PO 7 (K1)	PO 8 (K3)	PO 9 (K3)	PO 10 (K2)	PO 11 (K5)	PO 12 (K2)	PSO1 (K5)	PSO2 (K5)
CO1 K3	2	1	1	1	1	-	-	2	--	-	1	3	1	1
CO2 K5	3	3	1	1	1	1	3	3	--	-	2	3	2	2
CO3 K5	3	3	-	1	1	-	-	3	--	-	2	3	2	2
CO4 K5	3	3	2	2	2	2	3	3	--	-	2	3	2	2
CO5 K5	3	3	2	2	2	2	3	3	--	-	2	3	2	2
CO6 K3	2	2	2	2	2	2	3	2	--	-	1	3	1	1

REFERENCE BOOKS:

Jain & Jain

O.P. Agarwal

PRINCIPAL
POLYTECHNIC
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POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name:DIPLOMA
Faculty Name:SK SHAJAHAN

Class	Semester	Name of The Subject	Subject Code	W.E.F
I DCE		Surveying-I	C-105	12-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
150 Hours	Theory 05	Practical	3	Internal 40	External 60	

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in

independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.
PSO2	Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1.To give knowledge regaring chain surveying with various difficulties, to give knowledge regarding compass surveying.

2.To give knowledge regarding leveling and its methods.

Course Outcomes:

1. Illustrate the Principles and classification of Surveying.
2. Identify corrections to Linear Measurements
3. Illustrate the Principles and classification of compass surveying
4. Identify the bearings, Omitted Measurements in Traversing
5. Recognize the concept of levelling and practice the methods of levelling.
6. Recognize the concept of contours and identify the other miner instruments in surveying.

1.0 Classification and Principles of Surveying

1.1 Concept of Surveying

1.2 Purpose of Surveying

1.2 Units of Linear and angular measurements

1.3 Instruments used for taking Linear and angular measurements

1.4 Classification of Survey based on instruments and purpose of field work – Engineering Surveys

1.5 Fundamental principles of surveying.

2.0 Chain Surveying

2.1 Equipment used and their functions, Chains and arrows. Metallic tapes and Steel tapes, ranging rods, offset rods, pegs, plumb bob, Optical square, Line ranger

2.2 Different operations in Chain Surveying- Direct ranging and Indirect ranging

2.3 Chaining on Flat ground, Chainind on sloping ground and chaining when high ground intervenes.

2.4 Setting out right angles with or with out cross staff

2.5 Principles of Chain triangulation. Types of stations and types of chain lines

2.6 Recording field notes – field book-Conventional signs.

2.7 Errors in chain survey

2.8 Correction due to incorrect length of Chain - problems

2.9 Obstacles in chain survey -methods to overcome obstacles – problems.

2.10 Calculations of area – different methods –Average Ordinate, Trapezoidal and Simpson’s rules - Problems

3.0 Compass Surveying

3.1 Purpose and principle of compass Survey

3.2 Parts of prismatic compass – identification and their function

3.3 Meridians - true meridian, magnetic meridian, arbitrary Meridian - Bearings-whole Circle bearing, Quadrantal bearing -. Dip, Declination and local attraction

3.4 conversion of whole circle bearing to Quadrantal bearing and vice versa

3.5 Local attraction- and its effects

3.6 Detection of local attraction and computation of corrected bearings – problems

3.7 Determination of included angles and true bearings of lines in a Compass Closed traverse from data – declination - Problems

3.8 Operations involved in field in Compass Survey – Types of compass surveys

3.9 Method of recording field notes

3.10 Plotting of Closed traverse-closing error and adjustments by Bowditch method.

3.11 Errors in Compass Surveying-Personal, Instrumental and Natural.

4.0 Levelling

4.1 Definition of levelling

4.2 Types of levelling instruments

4.3 Definitions :Datum or Datum plane,Reduced level, Level surface, Horizontal surface,. Vertical Line . Station. Mean sea level, and. Bench Mark

4.4 Component parts of a Dumpy level and their functions sketch of dumpy level

4.5 Temporary adjustments of a Dumpy level – setting , levelling and elimination of parallex

4.6 Steps involved in performing Temporary adjustments of a dumpy level.

4.7 Back sight, Fore sight, Intermediate sight and Change Point

4.8 Types of levelling staves

4.9 To 4.12 Tabulation of levelling field data, methods of reducing levels, height of instrument and Rise and fall methods, Comparision of height of instrument and Rise and fall methods, Computation of reduced levels by height of instrument and Rise and fall methods, and apply check

4.13 To 4.14 Errors in levelling -1. Natural and 2. Instrumental errors 3. Personal

4.15 Precautions to be taken to prevent errors in levelling

4.16 To 4.18 Errors due to 1. Curvature and 2. Refraction 3. Combined error - corrections

4.19 To 4.20 Types of Levelling - Describe in detail

4.21 Errors eliminated in Reciprocal levelling

4.22 Derivation of the formula for true difference in elevation and true error between two points in reciprocal levelling

4.23 To 4.24 Calculation of true difference in elevation and collimation error in reciprocal levelling

4.25 To 4.26Fundamental lines of dumpy level relationship among fundamental lines of dumpy level

4.27 Permanent adjustments of a dumpy level (one peg method only)

4.28 1. Contour, 2. Contour interval and 3. Horizontal equivalent

4.29 Characteristics of contours

4.30 Uses of contours

4.31 To 4.33 Methods of contouring – Description in detail contouring by blocks and contouring by Radial method

4.34 Interpolation of contours

4.35 Method of tracing contour gradient

1. **Uses and working principles of minor instruments** 5.1 Pentagraph

   5.2 Electronic Planimeter

   5.3 Abney level

G. Santu

PRINCIPAL
POLYTECHNIC
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology,
Kothapet, VIJAYAWADA-520 001

Program Name: DIPLOMA Faculty Name:
K.DIVYA SRI

Class	Semester	Name of the Subject	Subject Code	W.E.F
I DCE	I	Engineering Mechanics	C-106	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
150 Hours	Theory 5	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

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PSO1	Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.
PSO2	Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1.The students completing this course are expected to understand the concepts of forces and its resolution in different planes ,resultant of force system,Lami's theorem.

2.They are required to understand the concepts of centre of gravity and moments of inertia and their application, types of beam and their loading condition problems.

Course Outcomes:

CO1:Determine resultants of different force systems.

CO2:Apply conditions of static equilibrium to plane force systems

CO3: Determine centroid and center of gravity of composite bodies

CO4:Determine Moment of inertia and Mass moment of inertia of composite bodies

CO5: Solve problems in stresses and strains

CO6:Calculate reactions of different beams.

COURSE CONTENT

1. Forces & Moments

a) Definition of force - vectors and scalars - vector representation of aforce - systems of forces - co-planar forces.
b) Resultant of forces at a point – Parallelogram Law and Triangle Law of forces – Lami's theorem – Polygon law of forces – Resolution of forces.
c) Parallel forces – like and unlike – moment of force -its units and sense-couple-moment of a couple – properties of a couple.
d) Conditions of equilibrium of a rigid body subjected to a number of co-planar forces.
e) Structural members supporting co - planar forces- Types of supports- Types of beams - Types of loading - Determination of support reactions for simply supported beams with point loads and uniformly distributed loads

2. Centroid

a) Definitions – Centroid, Centre of gravity
b) Position of Centroid of standard figures like rectangle, triangle, parallelogram circle, semi-circle and trapezium.
c) Determination of location of Centroid of standard sections- T, L, I, Channel section, Z section,built up sections consisting of RSJs & flange plates and plane figures having hollow portion.

3. Moment of Inertia

a) Definition of Moment of Inertia
b) Perpendicular and parallel axes theorems
c) Moment of Inertia of standard sections like rectangle, triangle, circle and hallow circular sections

d) Moment of Inertia of built up sections- T, L, I, Channel section, and Z sections using parallel axis theorem
e) Moment of Inertia and radius of gyration of built-up sections consisting of the combinations of RSJ's & flange plates, channels & flange plates etc.
f) Polar Moment of Inertia of solid and hollow circular sections using Perpendicular axis theorem

4. Simple Stresses and Strains
a) Stress and strain – type of stresses and strains
b) Stress strain curves for ductile materials- mild steel, Elastic limit, Limit of proportionality, Yield point, Ultimate stress, Breaking stress, Working stress and Factor of safety.
c) Hooke's law – Young's modulus – deformation under axial load.
d) Shear stress and Shear Strain – Modulus of rigidity.
e) Longitudinal and lateral strain - Poisson's ratio, Bulk Modulus – relationship between elastic constants (proof not required, only problems).
f) Composite sections – effect of axial loads
g) Temperature stresses and strains – hoop stress – Temperature stresses in composite sections
h) Resilience – strain energy-proof resilience and modulus of resilience – maximum instantaneous stress due to gradual, sudden and shock loading.
i) Mechanical properties of materials - elasticity, plasticity, ductility, brittleness, malleability, stiffness, hardness, toughness, creep, fatigue- examples of materials which exhibit the above properties.

5. Shear force and Bending Moment
a. Beams – Types of beams – Cantilevers – Simply supported – Overhanging – Fixed and Continuous.
b. Types of supports – Roller – Hinged – Fixed,
c. Explanation of S.F and B.M. at a section
d. Relation between rate of loading SF and BM
e. Calculation of S.F. and B.M values at different sections for cantilevers Simply supported beams, overhanging beams under point loads and uniformly distributed loads, position and significance of points of contra flexure.
f. Drawing S.F and B.M diagrams by analytical methods – location of points of contra flexure.

REFERENCE BOOKS

1. Engineering Mechanics – N. H.Dubey (Tata McGraw Hill)
2. Engineering Mechanics - R.S.Kurmi
3. Engineering Mechanics - P.K. Abdul Latheef
4. Engineering Mechanics & Statics - Dayaratnam
5. Engineering Mechanics - N. Srinivasulu

G. Santu

PRINCIPAL
POLYTECHNIC
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology,
Kothapet, VIJAYAWADA-520 001

Program Name: DIPLOMA Faculty Name:
K.DIVYA SRI

Class	Semester	Name of the Subject	Subject Code	W.E.F
I DCE	I	Engineering Mechanics	C-106	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
150 Hours	Theory 5	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.
PSO2	Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1.The students completing this course are expected to understand the concepts of forces and its resolution in different planes ,resultant of force system,Lami's theorem.

2.They are required to understand the concepts of centre of gravity and moments of inertia and their application, types of beam and their loading condition problems.

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CO3: Determine centroid and center of gravity of composite bodies

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CO5: Solve problems in stresses and strains

CO6:Calculate reactions of different beams.

COURSE CONTENT

1. Forces & Moments

a) Definition of force - vectors and scalars - vector representation of aforce - systems of forces - co-planar forces.
b) Resultant of forces at a point – Parallelogram Law and Triangle Law of forces – Lami's theorem – Polygon law of forces – Resolution of forces.
c) Parallel forces – like and unlike – moment of force -its units and sense-couple-moment of a couple – properties of a couple.
d) Conditions of equilibrium of a rigid body subjected to a number of co-planar forces.
e) Structural members supporting co - planar forces- Types of supports- Types of beams - Types of loading - Determination of support reactions for simply supported beams with point loads and uniformly distributed loads

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a) Definitions – Centroid, Centre of gravity
b) Position of Centroid of standard figures like rectangle, triangle, parallelogram circle, semi-circle and trapezium.
c) Determination of location of Centroid of standard sections- T, L, I, Channel section, Z section,built up sections consisting of RSJs & flange plates and plane figures having hollow portion.

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a) Definition of Moment of Inertia
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a) Stress and strain – type of stresses and strains
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f. Drawing S.F and B.M diagrams by analytical methods – location of points of contra flexure.

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Kothapet, VIJAYAWADA-520 001

Program Name: DIPLOMA Faculty Name: M.RAMYA

Class	Semester	NAME OF THE SUBJECT	SUBJECT Code	W.E.F
IDCE		ENGINEERING DRAWING	C107	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
180 Hours	Theory 3	Practical 3	3	Internal 40	External 60

Programme Outcomes:

1.Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1: Applying concepts and solving problems in the branches of Civil engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical engineering.

PSO2: Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1. Engineering drawing being the principle method of communication for engineers, the objective to introduce the students, the techniques of constructing the various types of polygons, curves and scales.
2. The objective is also to visualize and represent the 3D objects in 2D planes with proper dimensioning, scaling etc.

Course Outcomes:

CO1: Write Free Hand Lettering and Numbers and Understand Dimensioning Practice.

CO2: Understand Principles of Geometric Constructions.

CO3: Understand and draw Principles of Projection of points, lines, planes & solids

CO4: Draw sectional views and true sections of regular solids.

CO5: Convert the isometric view to orthographic view and vice versa.

CO6: Interpret Development of surfaces of different solids.

COURSE CONTENT

1) The importance of Engineering Drawing

Explanation of the scope and objectives of the subject of Engineering Drawing, Its importance as a graphic communication -Need for preparing drawing as per standards – SP-46–1988 – Mention B.I.S - Role of drawing in engineering education – Link between Engineering drawing and other subjects of Study.

2) Engineering drawing Instruments

Classification: Basic tools, tools for drawing straight lines, tools for curved lines, tools for measuring Distances and special tools like mini drafter & drafting machine – Mention the names under each Classification and their brief description -Scales: Recommended scales reduced & enlarged scales-

Lines: Types of lines, selection of line thickness - Selection of Pencils -Sheet Sizes: A0, A1, A2, A3, A4, A5, Layout of drawing sheets in respect of A0, A1, A3 sizes, Sizes of the Title block and its Contents - Care and maintenance of Drawing Sheet

Drawing Plate 1: Consisting of two exercises on use of drawing instruments

3) Free hand lettering & numbering

Importance of lettering – Types of lettering -Guide Lines for Lettering- Practicing letters & numbers of Given sizes (7mm, 10mm and 14mm) Advantages of single stroke or simple style of lettering

Drawing plate 2: Consisting of five to six exercises on freehand Lettering & Numbering

4) Dimensioning practice

Purpose of engineering Drawing, Need of B.I.S code in dimensioning -Shape description of an Engineering object - Dimensioning size, Location features, surface finish, fully dimensioned Drawing - Notations or tools of dimensioning, dimension line, extension line, leader line, arrows, symbols, number and notes, rules to be observed in the use of above tools - Placing dimensions: Aligned system and unidirectional system (SP-46- 1988) - Arrangement of dimensions: Chain, parallel, combined, progressive, and dimensioning by co-ordinate methods - The rules for dimensioning standard features Circles (holes) arcs, angles, tapers, chamfers, and dimensioning of narrow spaces

Drawing Plate 3: Consisting of 8 exercises on Dimensioning methods and rules

5) Geometric Constructions

Division of a line: to divide a straight line into given number of equal parts internally and it‘s examples in engineering applications. Construction of tangent lines: to draw tangent lines touching circles internally and externally. Construction of tangent arcs i) To draw tangent arc of given radius to touch two lines inclined at given angle (acute, right and obtuse angles) ii) Tangent arc of given radius touching a circle or an arc and a given line iii) Tangent arcs of radius R, touching two given circles internally and externally Construction of polygon: Construction of any regular polygon of given side using general method. Conical Curves: Explanation of Ellipse, Parabola, Hyperbola, as sections of a double cone and loci of a moving point, Eccentricity of above curves – Their Engg. applications viz. Projectiles, reflectors, P-V Diagram of a Hyperbolic process - Construction of ellipse by concentric circles method - Construction of parabola by rectangle method - Construction of rectangular hyperbola - General Curves: Involute, Cycloid and Helix, explanations as locus of a moving point, their engineering applications, viz, Gear tooth profile, screw threads, springs etc. - their construction.

Drawing Plate 4: Consisting of eight exercises on construction of polygons

Drawing Plate 5: Consisting of eight exercises on construction of conics

Drawing Plate 6: Consisting of eight exercises on involute, cycloid and helix

6) Projection of points, lines, planes & solids

Projecting a point on two planes of projection -Projecting a point on three planes of projection - Projection of straight line i) Parallel to both the planes ii) Perpendicular to one of the planes iii) Inclined to one plane and parallel to other plane - Projection of regular planes- i) Plane perpendicular to HP and parallel to VP and vice versa ii) Plane perpendicular to HP and inclined to VP and vice versa - Projection of regular solids with i) Axis perpendicular to one of the planes ii) Axis parallel to VP and inclined to HP and vice versa

Drawing Plate 7: Consisting of eight exercises on projection of points and Lines

Drawing Plate 8: Consisting of eight exercises on projection of planes

Drawing Plate 9: Consisting of eight exercises on projection of solids

7) Auxiliary views

Need for drawing auxiliary views - Explanation of the basic principles of drawing auxiliary views, explanation of reference plane and auxiliary plane - Partial auxiliary view.

Drawing plate 10: Consisting of four exercises on auxiliary views

8) Sectional views

Need for drawing sectional views – what is a sectional view - Location of cutting plane – Purpose of cutting plane line – Selection of cutting plane to give maximum information (vertical and offset planes) - Hatching – Section of regular solids inclined to one plane and parallel to other plane

Drawing Plate 11: Consisting of six exercises on sections of solids

9) Orthographic Projections

Meaning of orthographic projection -Using a viewing box model – Number of views obtained on the six faces of the box, - Legible sketches of only 3 views for describing object - Concept of front view, top view, and side view, sketching these views for number of engineering objects - Explanation of first angle projection. – Positioning of three views in First angle projection - Projection of points as a means of locating the corners of the surfaces of an object – Use of mitre line in drawing a third view when other two views are given - Method of representing hidden lines - Selection of minimum number of views to describe an object fully

Drawing Plate 12: Consisting of 12 exercises on orthographic projections of engineering objects.

10) Pictorial Drawings

Brief description of different types of pictorial drawing viz., Isometric, oblique, and perspective and their use - Isometric drawings: Iso axis, angle between them, meaning of visual distortion in dimensions - Need for an isometric scale, difference between Isometric scale, and ordinary scaledifference between Isometric view and Isometric projection - Isometric and Non-isometric lines -

Isometric drawing of common features like rectangles, circular shapes, non-isometric lines - Use of box and offset methods

Drawing plate 13: Consisting of 12 exercises on Isometric views of engineering objects

11) Development of Surfaces

Need for preparing development of surface with reference to sheet metal work -Concept of true length of a line with reference to its orthographic projection when the line is (i) parallel to the plane of projection (ii) inclined to one principal plane and parallel to the other -Development of simple solids like cubes, prisms, cylinders, cones, pyramids -Types of development: Parallel line and radial line development -Procedure of drawing development - drawings of trays, funnels, 900 elbow pipes and rectangular ducts.

Drawing plate 14: Consisting of 5 exercises on development problems

REFERENCE BOOKS

Engineering Graphics by P I Varghese – (McGraw-hill)

Engineering Drawing by Basant Agarwal & C.M Agarwal - (McGraw-hill)

Engineering Drawing by N.D.Bhatt.

T.S.M. & S.S.M on ― Technical Drawing‖ prepared by T.T.T.I., Madras.

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G. Santu

PRINCIPAL
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College of Engineering & Technology,
Kothapet, VIJAYAWADA-520 001

Program Name: DIPLOMA Faculty Name: M.RAMYA

Class	Semester	NAME OF THE SUBJECT	SUBJECT Code	W.E.F
IDCE		ENGINEERING DRAWING	C107	12/06/2018

SYLLABUS

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CO5: Convert the isometric view to orthographic view and vice versa.

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Drawing Plate 1: Consisting of two exercises on use of drawing instruments

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Importance of lettering – Types of lettering -Guide Lines for Lettering- Practicing letters & numbers of Given sizes (7mm, 10mm and 14mm) Advantages of single stroke or simple style of lettering

Drawing plate 2: Consisting of five to six exercises on freehand Lettering & Numbering

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Purpose of engineering Drawing, Need of B.I.S code in dimensioning -Shape description of an Engineering object - Dimensioning size, Location features, surface finish, fully dimensioned Drawing - Notations or tools of dimensioning, dimension line, extension line, leader line, arrows, symbols, number and notes, rules to be observed in the use of above tools - Placing dimensions: Aligned system and unidirectional system (SP-46- 1988) - Arrangement of dimensions: Chain, parallel, combined, progressive, and dimensioning by co-ordinate methods - The rules for dimensioning standard features Circles (holes) arcs, angles, tapers, chamfers, and dimensioning of narrow spaces

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Projecting a point on two planes of projection -Projecting a point on three planes of projection - Projection of straight line i) Parallel to both the planes ii) Perpendicular to one of the planes iii) Inclined to one plane and parallel to other plane - Projection of regular planes- i) Plane perpendicular to HP and parallel to VP and vice versa ii) Plane perpendicular to HP and inclined to VP and vice versa - Projection of regular solids with i) Axis perpendicular to one of the planes ii) Axis parallel to VP and inclined to HP and vice versa

Drawing Plate 7: Consisting of eight exercises on projection of points and Lines

Drawing Plate 8: Consisting of eight exercises on projection of planes

Drawing Plate 9: Consisting of eight exercises on projection of solids

7) Auxiliary views

Need for drawing auxiliary views - Explanation of the basic principles of drawing auxiliary views, explanation of reference plane and auxiliary plane - Partial auxiliary view.

Drawing plate 10: Consisting of four exercises on auxiliary views

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Need for drawing sectional views – what is a sectional view - Location of cutting plane – Purpose of cutting plane line – Selection of cutting plane to give maximum information (vertical and offset planes) - Hatching – Section of regular solids inclined to one plane and parallel to other plane

Drawing Plate 11: Consisting of six exercises on sections of solids

9) Orthographic Projections

Meaning of orthographic projection -Using a viewing box model – Number of views obtained on the six faces of the box, - Legible sketches of only 3 views for describing object - Concept of front view, top view, and side view, sketching these views for number of engineering objects - Explanation of first angle projection. – Positioning of three views in First angle projection - Projection of points as a means of locating the corners of the surfaces of an object – Use of mitre line in drawing a third view when other two views are given - Method of representing hidden lines - Selection of minimum number of views to describe an object fully

Drawing Plate 12: Consisting of 12 exercises on orthographic projections of engineering objects.

10) Pictorial Drawings

Brief description of different types of pictorial drawing viz., Isometric, oblique, and perspective and their use - Isometric drawings: Iso axis, angle between them, meaning of visual distortion in dimensions - Need for an isometric scale, difference between Isometric scale, and ordinary scaledifference between Isometric view and Isometric projection - Isometric and Non-isometric lines -

Isometric drawing of common features like rectangles, circular shapes, non-isometric lines - Use of box and offset methods

Drawing plate 13: Consisting of 12 exercises on Isometric views of engineering objects

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Need for preparing development of surface with reference to sheet metal work -Concept of true length of a line with reference to its orthographic projection when the line is (i) parallel to the plane of projection (ii) inclined to one principal plane and parallel to the other -Development of simple solids like cubes, prisms, cylinders, cones, pyramids -Types of development: Parallel line and radial line development -Procedure of drawing development - drawings of trays, funnels, 900 elbow pipes and rectangular ducts.

Drawing plate 14: Consisting of 5 exercises on development problems

REFERENCE BOOKS

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Engineering Drawing by Basant Agarwal & C.M Agarwal - (McGraw-hill)

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College of Engineering & Technology,
Kothapet, VIJAYAWADA-520 001

Program Name:DIPLOMA
Faculty Name:P.P. MUNINDRA

Class	Semester	Name of The Subject	Subject Code	W.E.F
I DCE		Surveying lab	C-108	11-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
120 Hours	Theory	Practical 04	3	Internal 40	External 60	

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

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Programme Specific Outcomes:

- **PSO1** Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.

- **PSO2** Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1.To give knowledge regarding chain surveying skills and compass surveying skills.

2.To give knowledge regarding leveling and contouring .

Course Outcomes:

1. Student should perform chain surveying in the field and able to prepare drawings from surveyed data.
2. Student should perform compass survey and able to prepare drawings from surveyed data.
3. Student should perform different methods of levelling.

LIST OF EXPERIMENTS:

1.Chain Surveying

1. Practice unfolding and folding of a chain.
2. Ranging and chaining of lines on level ground and recording in field book to measure the distance between two stations.
3. Chaining a line involving indirect ranging.
4. Setting and measuring the offsets-Perpendicular and Oblique offsets
5. Measurement of land areas –cross staff survey
6. Chain triangulation around the building covering a small area with other details taking offsets and recording.
7. Chain triangulation involving a road with other details taking offsets and recording.
8. Chain traversing to survey an area bounded by more than three stations.

2.Compass Surveying

1. Setting up the compass – observations of bearings
2. Calculation of included angles from the observed bearings
3. Traversing with prismatic compass and chain – open Traverse – Recording.
4. Traversing with prismatic compass and chain- closed traverse - recording.

5.Plotting the closed traverse from field data and adjust for closing error by Bowditch rule.

6.Determination of the area bounded by the given points by the method of Radiation

7.Determination of the distance between two accessible points involving single setting of the instrument

8.Determination of the distance between two inaccessible points involving setting of the instrument at two stations.

3.0 Levelling

3.1 Study of dumpy level, levelling staff and Temporary adjustments of level.

3.2 Taking levels of various points and booking the same in a level field book.

3.3 Differential or Fly levelling, reducing levels by Height of Collimation and Rise & Fall method.

3.4 Differential levelling involving inverted levels.

3.5 Reciprocal levelling.

3.6 Taking levels of Longitudinal Section and Cross Sections of a Road

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Program Name: DIPLOMA Faculty Name: P.NARESH

Class	Semester	Name of the Subject	Subject Code	W.E.F
I DCE	Year end	Engineering Physics Lab	C-109A	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
45 Hours	Theory	Practical 3	3	Internal 20	External 30

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Civil Engineering such as Basic knowledge of Calculus.
PSO2	Enabling students to understand the concept of different sectors in diploma to uplift their technical levels.

Course Objectives:

1. The students completing this course are expected to understand the concepts of Engineering physics and its applications.

2. The student will able to work n any field with the basic knowledge of physics.

Course Outcomes:

1. Student can able to measure accurately with vernier calipers and screw gauge.
2. Student can able to determine the values of surface tension and viscosity effectively.
3. Student can able to draw the magnetic lines of force.

Course content:

1.0 Practice with Vernier calipers to determine the volumes and areas of a cylinder and sphere and their comparison etc .
2.0 Practice with Screw gauge to determine thickness of a glass plate, cross sectional area of a wire and volumes of sphere and also their comparison etc
3.0 Verify the parallelogram law and Triangle law
4.0 Determine the value of acceleration due to gravity using Simple Pendulum
5.0 Determine the velocity of sound in air at room temperature and its value at zero degree centigrade
6.0 Calculate the Focal length and focal power of convex lenses using distant object method , U-V method, U-V graph and 1 / U – 1 / V graph methods and their comparison,
7.0 Determine the refractive index of a solid using travelling microscope
8.0 Determine the surface tension of a liquid using travelling microscope
9.0 Determine the viscosity of a liquid using capillary method
10.0 Verify the Boyle's law employing a Quill tube
11.0 Determine the specific resistance of material of a wirel using Meter Bridge
12.0 Drawing magnetic lines of force under N-S and N-N methods and locate null points

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Program Name: Diploma Faculty Name: B. Anil Kumar

Class	year	Name of the Paper	Paper Code	W.E.F
I DCE	I	Engineering Chemistry Lab	C-110	12-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of year end examination in Hours	Max Marks	
48	Theory	Practical 3	3	Internal 20	External 30

Programme Outcomes:

Program Outcome	
PO1.	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
Selected as application of knowledge of mathematics and science is involved in calculating troubles by chemical methods and instrumental methods of analysis.	
PO2.	Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Selected as students can identify and analyze complex engineering problems and can adopt new methods .	
PO3.	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
Selected as the student can develop chemical and instrumental methods for the public health and safety, and the cultural, societal, and environmental considerations.	
PO4.	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
Selected as students are required to do experiments using electronic devices like	

conductometers, potentiometers.	
PO5.	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
selected as the course apply appropriate techniques and modern engineering tools	
PO6.	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
selected as the contextual knowledge of conductance, potential of materials helps to assess societal, health and safety issues	
PO7.	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
Selected as the course address issues related to environment and sustainability.	
PO8.	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
Selected as the course apply ethical principles and responsibilities and norms of the engineering practice.	
PO9.	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
Not selected as the course does not related.	
PO10.	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
Not Selected as the course does not address complex engineering activities with the engineering community.	
PO11.	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
Not Selected as course does not relate to this.	
PO12.	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
Selected as student can recognize the need for life-long learning in the context of technological change.	

Programme Specific Outcomes:

Programme Specific Outcomes	
PSO 1	Produce graduates who will demonstrate skills required to communicate, collaborate and continue to learn effectively as ethically and socially responsible computer science and engineering professionals.
Not selected as the course does not address any aspects.	
PSO 2	Produce graduates who will be employed as Computer Science & Engineering professionals who serve beyond entry level positions in industrial/R&D organizations and/or be making satisfactory progress in higher degree programs in national/international repute institutes.
Not selected as the course does not address any aspects.	
PSO 3	Predict the changing direction of information technology and evaluate and communicate the likely utility of new technologies to computer science and engineering professionals.
Not selected as the course does not address any aspects.	
PSO 4	Ensure employability and career development skills through Industry oriented mini & major projects, internship, industry visits, seminars and workshops.
Not selected as the course does not address any aspects.	

Course Objectives:

1. The students entering into the professional course have practically very little exposure to lab classes.
2. The experiments introduce volumetric analysis; redox titrations with different indicators; EDTA titrations; then they are exposed to a few instrumental methods of chemical analysis.

Course Outcomes:

* Develop the knowledge of volumetric and instrumental methods of analysis in determining the quality of unknown products.

* Enhance the knowledge how to determine the quantity of the unknown products.

List of Experiments

1. Familiarization of methods of Volumetric analysis- Introduction to chemistry laboratory
2. Preparation of Std Na_2co_3 and making solutions of different dilution solution.
3. Estimation of HCL using std. Na_2co_3 solution
4. Estimation of NaoH using Std. HCL Solution
5. Estimation of H_2so_4 using Std. NaoH solution
6. Estimation of Mohr’s salt using Std. $KMno_4$
7. Determination of acidity of water sample
8. Determination of alkalinity of water sample
9. Determination of total hardness of water using Std. EDTA
10. Estimation of chlorides present in water sample
11. Estimation of Dissolved Oxygen (D.O) in water sample
12. Determination of P^H using P^H meter
13. Determination of conductivity of water and adjusting ionic strength to required level
14. Determination of turbidity of water

15. Estimation of total solids present in water sample

Course	**PO1 (K3)**	**PO2 (K1)**	**PO3 (K6)**	**PO4 (K6)**	**PO5 (K6)**	**PO6 (K6)**	**PO7 (K1)**	**PO8 (K3)**	**PO9 (K3)**	**K2) PO10**	**K5) PO11**	**K2) PO12**	**K5) PSO1**	**K5) PSO2**	**K5) PSO3**	**K3) PSO4**
CO1(k 6)	3	3	2	2	2	2	3	3	0	0	0	3	0	0	0	0

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Program Name: **DIPLOMA** **Faculty Name: M.Deepika**

Class	Semester	Name of the subject	Subject Code	W.E.F
I	-	Computer Fundamentals Lab	C-111	12/6/18

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
Hours 90	Theory	Practical 3	3 HOURS	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1:	Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.
PSO2:	Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1. The students should know the basic knowledge about Computers and its hardware parts.
2. The students should know about OS installations and Networking Concepts.

Course Outcomes:

1. Study of Diffrerent types of Trouble shooting Techniques.
2. Study of Computer Assembly and Networking concepts.
3. Study about mobile devices, laptops, printers and various security features.

COURSE CONTENT

1. Introduction to personal computers
2. Introduction to lab procedures and tools use
3. Computer Assembly
4. Overview of Preventive maintenance
5. Windows installation
6. Windows configuration and management
7. Networking concepts
8. Applied Networking
9. Laptops and mobile Devices
10. Mobile,Linux and OS X operating systems
11. Printers
12. Security
13. The IT Professional
14. Advanced Trouble Shooting

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Program Name:DIPLOMA Faculty Name:E.Sundesh Babu

Class	Semester	Name of the Subject	Paper Code	W.E.F
II DCE	III	Engineeering Mathematics-II	C-301	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory 6	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Civil Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Civil Engineering Diploma Students acquire practical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1.The students completing this course are expected to understand the basic knowledge on Derivatives as well as Integration.

2.The student shall be able to apply their basic knowledge in various applications.

Course Outcomes:

CO1. Using the concept of Indefinite integral as an anti-derivative.

CO2. Applying Real life applications of definite integrals.

CO3. Using real and repeated, Complex conjugates.

Course Content:

1. Indefinite Integration

A) Concept of Indefinite integral as an anti-derivative.State the indefinite integral of standard functions.Properties of Integrals $\int (u + v)dx$ and $\int ku\, dx$ where k is constant and u, v are functions of x.Solve integration problems involving standard functions using the above rules.
Evaluate integrals involving simple functions of the following type by the method of substitution
$\int f(ax + b)\, dx$ *where* $f(x)\, dx$ is in standard form.
$\int [f(x)]^n f'(x)\, dx$
$\int f'(x)/[f(x)]\, dx$
$\int f\{g(x)\}\, g'(x)\, dx$

B)Integrals of *tan x, cot x, sec x* and *cosec x* using the above.Integrals of the form $\int Sin^m\theta\ Cos^n\theta.\ d\theta$ where m and n are positive integers.Evaluate integrals of powers of *tan x* and *sec x*.
Evaluate the Standard Integrals of the functions of the type.Evaluate the integrals of the type
Evaluate integrals using decomposition method.Evaluate integrals using integration by parts with examples.State the Bernoulli's rule for evaluating the integrals of the form$\int u.vdx$.
Evaluate the integrals of the form $\int e^x [f(x) + f'(x)]\, dx$.

2. Definite Integrals & its Applications

A) State the fundamental theorem of integral calculus.Explain the concept of definite integral.
Calculate the definite integral over an interval.State various properties of definite integrals.
Evaluate simple problems on definite integrals using the above properties.Explain definite integral as a limit of sum by considering an area.Find the areas under plane curves and area enclosed between two curves using integration.Obtain the volumes of solids of revolution.
Obtain the mean value and root mean square value of the functions in any given interval.
Explain the Trapezoidal rule, Simpson's 1/3 rules for approximation of integrals and provide some examples.Write the definition of Laplace Transform and explain sufficient conditions for its existence.
B) Provide formulae for Laplace transforms of standard functions.State Linear property, First shifting property, Change of Scale property for Laplace transforms. Solve simple problems using these properties.Write formulae for Laplace transform of $\int$ in terms of Laplace transform of $f(t)$.
Provide simple examples on these functions.Define unit step function and write the Laplace Transform of unit step function.State second shifting property.Define inverse Laplace Transform and write inverse Laplace Transform of standard functions. Solve simple problems.
Write first shifting property of inverse Laplace Transform with examples
Define convolution of two functions and state convolution theorem with few examples for understanding only.Define Fourier series of a function on the interval $c, c + 2l$ and state sufficient conditions for its existence. Write the Euler's formulae for determining the Fourier coefficients.Find Fourier series of simple functions in the range $(0,2l)$,$(0,2\pi)$, $(-l, l)$ *and* $(-\pi, \pi)$.
Find Fourier coefficients for even and odd functions in the interval $-l, l$ *and* $-\pi, \pi$

in simple examples.Define half range Fourier sine and cosine series of a function over the interval $(0, l)$ with examples.

3. Differential Equations

A) Define a Differential equation, its order, degree Form a differential equation by eliminating arbitrary constants.Solve the first order first degree differential equations by the following methods:Variables Separable,Homogeneous Equations,Exact Differential Equations
Linear differential equation of the form dy/dx + Py = Q,where P and Q are functions of x or constants.Bernoulli's Equation (Reducible to linear form.)Solve Differential equations of the type $(aD^2 + bD + c)y = 0$ when the roots of the auxiliary equation are real and different, real and repeated, Complex conjugates.Solve the higher order homogeneous differential equations with constant coefficients.Explain the concept of complementary function, particular Integral and general solution of a differential equation.
B) Solve nth order differential equation of the type $f(D)\ y = X$ where $f(D)$ is a polynomial of nth order and X is a function of the form $k,\ e^{ax},\ Sinax,\ Cosax,\ x^n$.Solve simple problems leading to engineering applications.

REFERENCE BOOKS:

1. Integral Calculus Vol.I, by M. Pillai and Shanti Narayan.
2. Thomas' Calculus, Pearson Addison -Wesley Publishers.
3. A Text book of Engg. Mathematics by B.S.Grawel.
4. A Text book of Engg. Mathematics by B.V.Ramana- T.Mc Graw Hill Publishers.

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Program Name:DIPLOMA
Faculty Name:P.P.MUNINDRA

Class	Semester	Name of The Subject	Subject Code	W.E.F
II DCE	III SEMESTER	Strength of materials & Theory of structures	C-302	12-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
90 Hours	Theory 6	Practical	3	Internal 20	External 80	

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.
PSO2	Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1.To give preliminary concepts of Strength of Material ,sresses developed in the cross section ,deflections in beams under various loading and support condtions and classify the cylinders.

2.To give concepts of torsion, to classify columns by various empirical formulae , to classify the dams and retaining walls and stresses developed in simple frames.

Course Outcomes:

1. Determine Stresses in Beams, Derive the equation of bending, Determination of bending stresses in beams of various cross sections and Derive Shear stresses in Beams with various cross sections.
2. Determine slope & deflection in beams of different cross sections and end conditions for various types of loading using different methods.
3. Definition of principal stress,principal planes and importance of Mohr's circle,Concept of Torsion and springs,shear stresses in shafts and calculation of deflection in springs with axial loading.
4. Calculation of hoop stresses and longitudinal stresses in Unrivetted thin cylinders.
5. Examine the Crippling & Safe loads using Euler's & Rankine's theories for the columns with different end conditions.
6. Synthesize the stresses for the column under eccentric loads, Dams & Retaining walls.

UNIT-I

Stresses in Beams.

1.1 Theory of simple bending-Neutral axis-Modulus of section, Moment of resistance

1.2 Assumptions made in the theory of simple Bending.

1.3 Formula for Theory of simple bending – Bending stress distribution.

1.4 Theory of simple bending-problems

1.5 Shear stresses in Beams -Shear stress distribution across rectangular, solid circular and I sections. (Derivation of formula not required.)

UNIT-II

Deflection of Beams

2.1 Equation of the elastic curve - Relation between curvature, slope and deflection

2.2 Strength and stiffness of a beam.

2.3 Slope &deflection by Double integration method, Mecaulay's method for simply supported and Cantilever beams subjected to Point loads and uniformly distributed loads

2.4 Mohr's theorem-I & II for slope &deflection.

2.5 Slope & deflection by Mohr's theorem for simply supported and Cantilever beams subjected to Point loads and uniformly distributed loads

2.6 Section of a beam from consideration of strength and stiffness.

2.7 Difference between statically determinate and statically indeterminate structures.

2.8 Prop reaction of propped cantilever beams - various types of loadings (point & u.d.l) - S.F.D and B.M.D.

2.9 Fixed and Continuous beams – degree of static indeterminacy – deflected shapes under loading (no necessity to solve problems on the topic)

UNIT-III

Principal stresses, Planes & Mohr's Circle

Definition of principal stress, principal planes and importance of Mohr's circle.

UNIT-IV

Torsion & Springs

4.1 Theory of pure torsion-Torsion formula-solid and hollow circular shafts subjected to pure torsion-simple problems-shear stress distribution in shafts – power transmitted by a shaft – simple problems

4.2 Calculates the deflection of a closely coiled helical spring under a given axial loading.

UNIT-V

Thin Cylinders

5.1 Longitudinal and Hoop stresses in Unrivetted thin cylinders subjected to internal fluid pressure - calculation of thickness in thin cylinders under internal pressures-problems.

UNIT-VI

Columns

6.1 Columns - Effective lengths for different end conditions.

6.2 Columns - Long and short columns – Comparison.

6.3 Slenderness ratio of a column – Rectangular, I, circular, Hollow Circular, Built-up Sections.

6.4 Load carrying capacity by Euler‘s and Rankin‘s formula – problems - Limitations.

UNIT-VII

Dams and retaining walls

7.1 Forces acting on the Gravity Dam – Eccentricity, middle third rule.

7.2 Intensity of base pressures acting on the Gravity dam for different water storage levels.

7.3 Stability conditions of Gravity Dams.

7.4 Base width of the dam based on Stability conditions – problems.

7.5 Active and passive Earth pressures without surcharge–Angle of internal friction

7.6 Forces acting on the Retaining wall - Eccentricity, middle third rule.

7.7 Intensity of base pressures acting on the Retaining wall.

7.8 Stability conditions of Retaining wall.

7.9 Base width calculation - based on Stability conditions.

UNIT-VIII

Stresses in frames

8.1 Forces in the members of statically determinate pin jointed frames-method of Joints and method of sections.

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Program Name: DIPLOMA Faculty Name:S.NAGALAKSHMI

Class	Semester	Name of the Subject	Subject Code	W.E.F
II DCE	III	HYDRAULICS	C-303	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory 6	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: Applying concepts and solving problems in the branches of civil engineering such as structural, Environmental,Hydraulics, Construction Management and Geo technical Engineering

PSO 2:Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of civil engineering.

Course Objectives:

1. Understands the General Principles of flow of the Liquids

2. Understands types and working of pumps and turbines

Course Outcomes:

CO1 : Develop different types of most economical channel sections and Classify types of flows

CO2:Formulate an expression for G.V.F, Hydraulic jump and Describe types of surface profiles

CO3 :Solve problems on dimensionless numbers & prototype relations by applying Rayleigh's and Buckingham's pi theorems.

CO4 : Evaluate Hydrodynamic forces of jet & efficiency on different shaped stationary & moving vanes.

CO5: Appraise velocity & efficiency of different turbines

CO6: Examine work done by different pumps

COURSE CONTENT:

1.0 Properties of Liquids

1.1 Scope and importance of hydraulics in Civil Engineering.
1.2 Definition and properties of liquids-as mentioned in specific objectives
1.3 Formulae of Dynamic viscosity, Capillarity, Surface tension, Kinematic Viscosity (problems not required)

2.0 Liquid Pressure and its Measurement

2.1Atmospheric pressure, gauge pressure and absolute pressure.
2.2Types of Pressure measuring instruments – Simple and Differential Manometers.
2.3Determination of the pressure of a flowing liquid given the readings on a piezometer, simple, differential and inverted differential manometers.
2.4Determination of Total and Centre of Pressure on Plane surface on horizontal and vertical immersed Plane surfaces..(No derivation of formulae, problems only)

3.0 Flow of Liquids

3.1Types of flow-uniform flow, non-uniform flow, stream-line flow, turbulent flow, steady flow and unsteady flow.
3.2Energies of liquid in motion-Datum head- pressure head and velocity head- principle of continuity.-problems
3.3Total energy of liquid in motion-Bernoulli‘s theorem (without proof) - limitations of Bernoulli‘s theorem.-problems.
3.4Practical applications of Bernoulli‘s theorem- pitot tube, orificemeter and venturimeter -problems on pitot tube and horizontal Venturimeter . (No derivation of formula.)

4.0 Flow through orifices and mouthpieces

4.1Definition of orifice and vena-contracta –types of orifices. Determination of discharge through small orifice

4.2Defines co-efficient of contraction, velocity and discharge.

4.3State the relation between Hydraulic Coefficients - Cc, Cv, and Cd. and solves problems on hydraulic co-efficients.

4.4Large rectangular orifice-derivation of formula for discharge and states the equations for discharge through Submerged and partially submerged orifices.

4.5Problems on discharge through a large rectangular orifice, Submerged orifices.

4.6Problems on determination of time of emptying of a prismatic tank by an orifice.

4.7Definition of Mouthpiece and Difference between orifices and mouthpieces

4.8Different types of mouth pieces with their C d values and determination of discharge through a mouth piece from the given details.

5.0 Flow over Notches & Weirs

5.1 Definition of notch, types of notches-rectangular, triangular and trapezoidal.

5.2 Formulae for Determination of Discharge for the above notches

5.3 State the advantages of triangular notch over rectangular notch.

5.4 Problems on Determination of Discharge for the Notches

5.5 Definition of Weir-types of weirs, sharp-crested and broad crested weirs.

5.6 Formulae for determination of Discharge over a sharp crested weir and broad crested weir.(Mathematical formula)

5.7Equations for Discharges for above Wiers with velocity of approach and end contractions.

5.8Determines the discharge over sharp crested and broad crested weirs underGiven conditions.

6.0 Flow thorough pipes

6.1Major loss (loss of head due to friction) and minor losses (Loss of head at entrance, loss of head due to sudden enlargement, loss of head due to sudden contraction, loss of head at exit of the pipe) - simple problems.

6.2Frictional loss in pipes - Chezy‘s formula and Darcy‘s formula (without Proof)– problems.

6.3Solves problems on a pipe flow under friction.

6.4Hydraulic gradient and total energy line.

6.5Discharge through parallel and compound pipes connected to a reservoir.

6.6Laminar and turbulent flow in pipes.

6.7 Reynolds‘s number and critical velocity.

7.0 Flow through open Channels

7.1Definition of open channel flow and differences between open channel flow and pipe flow.

7.2Wetted perimeter and hydraulic mean depth.

7.3Chezy‘s formula for discharge for uniform flow (Derivation not necessary).

7.4Value of‗C‘ for different surfaces.

7.4.1 Kutter‘s formula.

7.4.2 Manning‘s fourmula

7.4.3 Bazin‘s formula

7.5Determination of values of the velocity and discharge in a channel

7.6Conditions for Most economical section of a channel-rectangular and trapezoidal.

7.7Design of rectangular and trapezoidal channel cross sections – problems.

8.0 Pumps and Turbines

8.1Definition of pump and different types of pumps

8.2Different parts of centrifugal pumps.

8.3Uses of foot valve and strainer in a centrifugal pump.

8.4Types of reciprocating pumps.

8.5Uses of jet, air lift and deep well pumps.

8.6Differences between centrifugal & reciprocating pumps.
8.7Definition of turbine and different types of turbine.
8.8Impulse & reaction turbines and their types.
8.9Brief explanation of principle of working of Pelton wheel and Francis turbine.
8.10Differences between impulse and reaction turbines.
8.11Draft tube – Purpose and types.

9.0 Hydro-electric Power Plants

9.1Sketch of a typical layout of hydro-electric power plants and its
9.2The function of surge tank – water hammer effect in pen stocks.

REFERENCE BOOKS

1.Hydraulics	by	R.S. Khurmi.
2.Hydraulics & Hydraulic Machines	by	Modi & sethi.
3.Hydraulics	by	Jagdishlal.
4.Hydraulics	by	Reye & Rao
5.Hydraulics	by	R. K. Bansal.
6.Hydraulics	by	NITTTR,Chennai

G. Santu

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Program Name:DIPLOMA

Faculty Name:SK SHAJAHAN

Class	Semester	Name of The Subject	Subject Code	W.E.F
II DCE	IIISEM	Surveying-I I	C-304	12-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
75 Hours	Theory 05	Practical	3	Internal 40	External 60	

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in

independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.
PSO2	Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1.To give knowledge regarding theodolite surveying with various difficulties, to give knowledge regarding tachometry surveying.

2.To give knowledge regarding principles of total station and its methods.

Course Outcomes:

1. Illustrate the Principles and classification of theodolite.
2. Identify corrections to traverse
3. Illustrate the Principles and purpose of trigonometrical levelling
4. Identify the tachometry and Omitted Measurements, distances
5. Illustrate the curves and methods of curves.
6. Understand the principles of total station and types.

1. **Theodolite**

1.1Component parts, technical Terms, detailed study of a transit.

1.2Fundamental lines and their relationship.

1.3Temporary adjustments.

1.4Measurement of horizontal angles by repetition and reiteration method.

1.5Measurement of vertical angles.

1.6Determination of magnetic bearings- deflection angles- direct angles- Prolonging a straight line.

1.7Traversing with theodolite by included angle method, deflection angle method, bearing method.

1.8Checks for closed and open traverse

1.9Traverse computations, Latitude, departure, Errors in theodolite work.

2. **Trigonometric levelling**

2.1 Principle and necessity of Trigonometric levelling

2.2 Elevations and Distance of objects whose base is accessible and base is inaccessible with instruments station in same vertical plane and different vertical plane.

3. **Tacheometry**

3.1Types and advantages of tacheometry-Stadia Tacheometry with staff held vertical and line of collimation horizontal or inclined – finding elevations and distances of staff stations – problems – determination of Tacheometric constants

4. **Curves**

4.1Simple circular curve- definition and notations used - elements of simple curve

4.2Preparation of curve table and setting out curves by chain and tape - single and double Theodolite methods – problems.

5. **Total Station**

5.1.Parts and functions – setting up total station for taking observations - Use of Total Station - Measurement of distances and angles - multiple number of observations on a single station - measurement of area with single station setup – Traversing using a total station - orientation of total station by resection method – establishing TBM by station elevation method – staking out a point, line and an arc – marking the centre line for a typical residential building - LS and CS for proposed road / canal / pipe line

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Program Name: DIPLOMA

Faculty Name: S.SURYA PRAKASH

Class	Semester	Name of The Subject	Subject Code	W.E.F
II DCE	III SEMESTER	CONSTRUCTION MATERIALS	C-305	12-06-2018

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
90 Hours	6		3	20	80	

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable development

Development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

Diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in

Independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1 Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.

PSO2 Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1. To give preliminary concepts of classification of rocks and purpose of stones

2. To give concepts of sizes of bricks, characteristics of good bricks, water absorption tests

Course Outcomes:

1. To know the acceptability of bricks for construction work and steps involved in the manufacture of bricks
2. Determine the suitability of tiles ,pipes and buildings sand for construction
3. To check the quality of construction work
4. To state the grades of cement and their compressive strengths.
5. To understand the principals of preparation of motors and concrete
6. To understand the selection and applications of surface protective materials

UNIT-I

Understand the selection of stones and their acceptability for construction work

1.1 Classify rocks (Physical classification only)

1.2 List the characteristics of good building stones.

1.3 List the common varieties of stones (like Granite, marble, Kadapa slabs, Shahabad stones)

1.4 Explain the purpose of dressing stones

UNIT-II

Understands the acceptability of bricks for construction work

2.0 State common sizes of bricks – IS specifications.

2.1 List the steps involved in the manufacture of bricks.

2.2 Explain the method of burning of clay bricks in a continuous kiln.

2.3 List the characteristics of good bricks.

2.4 List the standard tests on bricks

2.5 Explain the following tests conducted on bricks

1. Water absorption and 2. Compressive strength

2.6 Explain the uses of the following types of bricks for construction purposes -

1.Refractory bricks,

2. Fly ash bricks.

UNIT-III

Understands the suitability of tiles, pipes and building sand for Construction

3.0 State the common varieties of tiles used for different purposes.

3.1 List the characteristics of good tiles.

3.2 List the uses of porcelain and glazed tiles.

3.3 State the uses of stone ware pipes.

3.4 List the characteristics of good sand.

3.5 State the functions of building sand.

3.6 State the percentage of bulkage allowance for construction work.

3.7 State the need for the quarry dust & robo sand as a substitute to sand.

UNIT-IV

Check the quality of cement for construction work

4.0 State the chemical composition of cement.

4.1 State rough and ready methods of examining cement

4.2 Explain the method of manufacture of cement by dry process only.

4.3 Types of cements

4.4 List the uses of various cements

4.5 State the standard tests for cement.

4.6 Explain the following tests on cement

Fineness,
Consistency,
Setting times.
Soundness

4.7 State grades of cement and their compressive strengths.

4.8 State the importance and application of blended cement with fly ash and blast furnace slag.

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UNIT-V

Understand the principles of preparation of mortars and Concrete

5.0 Explain 1.Fine aggregate and 2.Coarse aggregate.

5.1 Explain the purpose of water absorption and sieve analysis tests conducted on fine and coarse aggregates.(Procedure of tests not necessary).

5.2 Classify mortars.

5.3 List the different proportion of mortars for various works.

5.4 Explain the method of preparation of cement mortar .

5.5 List the ingredients of 1.Plain concrete and 2.Reinforced concrete.

5.6 State the usual proportions of plain and reinforced concrete for different items of work.

5.7 Define

Hydration of cement
Water cement ratio
Workability
Curing.

5.8 Explain the importance of 1.Hydration of cement and 2.water cement ratio.

5.9 States the types and uses of admixtures in concrete.

5.10 Explain the method of preparing concrete.

5.11 List the steps involved in the procedure of mixing, conveyance, placing, and compaction and curing of concrete.

5.12 List different curing compounds

5.13 List the methods of curing suitable for different surfaces.

5.14 Explain about ready mix concrete.

5.15 List the advantages and disadvantages of ready mix concrete.

5.16 List the uses of the following materials for improved durability and better resistance to adverse exposure conditions for concrete works

Fly ash,

Quarry dust

UNIT-VI

Understand the selections and applications of Surface Protective Materials

6.0 Give the composition of

Paints,
Enamels and
Varnishes.

6.1 List the types of the following surface protective materials:

Paints,

Enamels,
Varnishes,
Distempers,
Emulsion,
French polish and
Wax Polish.

6.2 List the uses of surface protective materials

UNIT-VII

Understand the selections and applications of Wood, Plastics, Glass and Asbestos for construction work

7.0 List the characteristics of good timber.

7.1 Define seasoning.

7.2 Explain the importance of seasoning of timber

7.3 Name the common varieties of timber used in A.P for various Civil Engineering works.

7.4 State various types of wood products used in construction work.

7.5 List the uses of wood products used in construction work.

7.6 List the uses of fibre reinforced plastic.

7.7 List merits and demerits of plastics.

7.8 List the merits and demerits of asbestos.

7.9 Explain suitability of different types of glasses as a building material.

7.10 List the uses of glass.

7.11 List the types of false ceiling materials

7.12 Understands the types and applications of Gypsum

7.13 State the Materials used for green buildings

7.14 State the applications of pre-painted G.I.sheets

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Program Name: DIPLOMA
Faculty Name: S.SURYA PRAKASH

Class	Semester	Name of The Subject	Subject Code	W.E.F
II DCE	III SEMESTER	CIVIL ENGINEERING DRAWING-I	C-306	12-6-2018

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 03	Practical 03	3	Internal 40	External 60	

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

Limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

Cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

Diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in

Independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.
PSO2	Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1. To provide knowledge regarding different components of buildings and planning residential buildings

2. To provide knowledge regarding public and industrial buildings and working drawings

Course Outcomes:

1. Student should be able mark the building components
2. Student should draw the various plans
3. Student should able draw the line diagrams and working drawings

UNIT I **Introduction**

1.1 Conventional signs for materials like bricks, stone, concrete, wood, glass, earth, steel and electrical fixtures like ceiling fan, bulb, main switch, refrigerator, bell push, buzzer, A.C motor, and water supply and sanitary fixtures like tap, wash basin, sink, W.C pan (Indian and European type), shower, flush tank.

1.2 Cross section of a load bearing wall, showing all the components, below and above the ground level.

1.3 Plan of one brick wall meeting at a corner, showing Odd and even courses in English bond.

1.4 Elevation & sectional plan of a Fully panelled door ,showing the component parts.

1.5 Elevation & sectional plan of a Fully panelled window, glazed window, showing the component parts.

1.6 Elevation of King post and Queen post trusses with the given data, showing the component parts. (Details of joints not required)

UNIT II **Residential Buildings:**

2.1 Set backs and orientation principles for planning residential buildings as per local bye laws and NBC

2.2 Single storied two bedroom load bearing residential building

2.3 Single storied framed structure two bedroom residential building

2.4 Dog legged stair

2.5 Two-storied residential building (framed structure type)

2.6 The standard format for obtaining sanction from local body for a residential building (two storied, two bedroom building) including a rainwater harvesting structure.

UNIT III **Public and industrial buildings**

Draw line diagrams only showing the functional requirements of

3.1 Rural hospital for 10 beds capacity

3.2 Hostel for 50 students

3.3 Primary school for 250 to 300 students

3.4 Apartments - Plan of one floor with 6 to 10 units @90 – 150 Sq.m/unit

UNIT IV **working drawings:**

4.1. Working drawing for the purpose of marking the width of foundation for the given plan

4.2. The working drawings for electrical layout for a given residential building
(two bedroom building – Ground floor only)

4.3. Lift shaft for multi storied building.

4.4. Active Solar water heating system.

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Program Name:DIPLOMA
Faculty Name:P.P.MUNINDRA

Class	Semester	Name of The Subject	Subject Code	W.E.F
II DCE	III SEMESTER	MATERIAL TESTING LABORATORY	C-307	12-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
45 Hours	Theory	Practical 03	3	Internal 40	External 60	

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

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8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

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10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1 Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.

PSO2 Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1.To give knowledge regarding tests that have to perform on building materials.

2.To give knowledge regarding tests that have to perform on soil.

Course Outcomes:

1. Student should perform tests on building materials such as bricks, cement, concrete and metals.
2. Student should perform tests on soils.

LIST OF EXPERIMENTS:

1.0 Tests on Bricks

a)Water absorption, b) Crushing strength c) Efflorescence.

2.0 Tests on Cement

Fineness test

Normal consistency test

Initial and final setting times of cement.

Compressive strength of cement.

3.0 Tests on Aggregates

Water absorption of Sand

Bulking of Sand : i) Laboratory test & ii) Field test

Percentage of voids in Coarse and fine aggregates

Sieve analysis of coarse and fine aggregates

Field method to determine fine silt in fine aggregate

Aggregate impact value for coarse aggregate

Specific gravity of fine and coarse aggregates

Bulk density of coarse aggregate and fine aggregates.

4.0Tests on Metals

Tension test on steel rod

0 Deflection Test on beam (Steel beam or wooden beam)

5.0 Tests on Concrete

Slump cone test.

Compressive strength –cube test.

6.0 Tests on soils

Liquid limit & plastic limit

Standard Proctor test for OMC & MDD

Field density by sand replacement and core cutter method.

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Program Name: DIPLOMA Faculty Name: S.NAGALAKSHMI

Class	Semester	Name of the Subject	Subject Code	W.E.F
II DCE	III	SURVEYING-II LAB	C-308	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
60 Hours	Theory	Practical 4	3	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: Applying concepts and solving problems in the branches of civil engineering such as structural, Environmental, Hydraulics, Construction Management and Geo technical Engineering

PSO 2:Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of civil engineering.

Course Objectives:

1. Performs Theodolite Surveying

2 . Field Exercises using Total Station

Course Outcomes:

CO1 : get practical knowledge in surveying

CO2: got the knowledge about total station

CO3 : usage of instruments of surveying in practical world

COURSE CONTENT:

1.0 Theodolite surveying

1.1 Study of transit Theodolite- Temporary adjustments of Theodolite.

1.2 Measurement of horizontal angles by reiteration and repetition method.

1.3 Measurement of vertical angles.

1.4 Determination of inaccessible horizontal distance involving two Instrument stations.

2.0 Trigonometric levelling

2.1 Determination of height and reduced level of the top and bottom of accessible object.

3.0 Tacheometry

3.1 Determination of constants of Tacheometry.

3.2 Determination of horizontal distance and elevation by Stadia Tacheometry.

4.0 Curves

4.1 Setting out a simple curve by chain and tape method.

5.0 Field Exercises using Total Station.

5.1 Study of the Total Station equipment.

5.2 Station setup and measuring distance.

5.3 Measurement of area.

5.4 Traversing with total station.

5.5 Height and width of the elevated object.

5.6 Orientation of Total Station by resection method.

5.7 Establishing T.B.M by Station Elevation Method.

5.8 Measure rounds (multiple sets of observations on a single station).

5.9 Establish the position of an occupied point relative to a base line or a boundary line

5.10 Staking out a point, line and an arc.

5.11 Marking of the centre line for proposed residential building.

5.12 L.S and C.S of a proposed road/Canal/pipeline.

5.13 Post processing.

5.14 Contouring.

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Program Name: DIPLOMA Faculty Name: S.NAGALAKSHMI

Class	Semester	Name of the Subject	Subject Code	W.E.F
II DCE	III	HYDRAULICS LABORATORY	C-309	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
45 Hours	Theory	Practical 3	3	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

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Programme Specific Outcomes:

PSO 1: Applying concepts and solving problems in the branches of civil engineering such as structural, Environmental, Hydraulics, Construction Management and Geo technical Engineering

PSO 2:Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of civil engineering.

Course Objectives:

1. Verifies Hydraulic Principles

2 . Study of Hydraulic machines.

Course Outcomes:

CO1 : Get practical knowledge in Hydraulics

CO2: Understand the usage of hydraulic machines in industries

CO3 Understand the application of hydraulics in practical world

COURSE CONTENT:

1.0 Verifies Hydraulic Principles:

Determination of coefficient of discharge of a small orifice by constant head method and variable Head Method

Determination of Cc of an orifice by finding C_v and C_d.

Determination of coefficient of discharge of a mouthpiece by constant head method.

Determination of coefficient of discharge of triangular, rectangular and trapezoidal notches.

Verification of Bernoulli‘s theorem.
Determination of coefficient of a discharge of a venturimeter.
Determination of the coefficients of friction of pipe flow.

Determination of Chezy‘s constant from flow through open channel.

2.0 Study of Hydraulic Machines

Study of reciprocating pump and centrifugal pump.

Study of turbines – Pelton wheel, Francis and Kaplan turbines.

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College of Engineering & Technology,
Kothapet, VIJAYAWADA-520 001

Program Name: DIPLOMA Faculty Name: S.NAGALAKSHMI

Class	Semester	Name of the Subject	Subject Code	W.E.F
II DCE	IV	REINFORCED CEMENT CONCRETE	C-401	14/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory 6	Practical	3	Internal 20	External 80

Programme Outcomes:

1. **Basic knowledge**: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. **Discipline knowledge**: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. **Experiments and practice**: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. **Engineering Tools**: Apply appropriate technologies and tools with an understanding of the limitations.

5. **The engineer and society**: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. **Environment and sustainability**: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. **Communication**: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: Applying concepts and solving problems in the branches of civil engineering such as structural, Environmental, Hydraulics, Construction Management and Geo technical Engineering

PSO 2:Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of civil engineering.

Course Objectives:

1. Understands the principles of analysis and design of singly reinforced and doubly reinforced R.C.C rectangular beams, by limit state method.

2. Understand the Properties of materials used in R.C.C, Loads to be considered and principles of working stress design

Course Outcomes:

CO1 : Work on Working Stress Method and Limit State Method design philosophies

CO2: Carryout analysis and design of singly and doubly reinforced flexural members

CO3 : Design the member subjected to shear, bond and torsion.

CO4 : Design the different types of compression members.

CO5: Design isolated and combined footings.

CO6: Design the One-way, Two-way slabs, Continuous and Waist-slab staircase.

COURSE CONTENTS:

1.0 Introduction to R.C.C and Principles of working stress design

1.1 Introduction to R.C.C, Loads to be considered and Introduction to I.S Codes and Assumptions in working stress method.

1.2 Characteristic compressive strength, modulus of elasticity of concrete.

1.3 Loads to be adopted in R.C.C. design – dead load, Live load, wind load(as per IS

875-1987) and earth quake loads(as per IS-1893).

1.4 Nominal Mix – Design Mix – differences.

1.5 Modular ratio – critical percentage of steel.

1.6 Balance, under reinforced, over reinforced sections.

1.7 Critical and actual neutral axis depth of singly reinforced beams.

1.8 Moment of resistance of simply supported singly reinforced beam sections.

1.9 Design of singly reinforced rectangular beam for flexure.

2.0 Philosophy of limit state Design

2.1 Introduction to Limit state design – philosophy – Limit state – Types of Limit states.

2.2 Strength and serviceability limit states, characteristic strength of materials and characteristic loads and partial safety factors.

2.3 Design strength of materials and design loads.

2.4 Assumptions made in the limit state design.

3.0 Analysis and design of Rectangular beams

3.1 Stress-strain diagram of singly reinforced RCC beam.

3.2 Depth of neutral axis, lever arm.

3.3 Moment of resistance of singly reinforced Rectangular section – balanced, under reinforced.

3.4 Critical percentage of steel.

3.5 Calculation of moment of resistance of the given section and design of singly reinforced rectangular beam for the given load as per IS 456-2000.

3.6 Doubly reinforced sections - necessity, use.

3.7 Calculation of neutral axis and moment of resistance for the given section and grades of concrete and steel (no derivation of the equations).

3.8 Shear in singly reinforced beams - nominal shears stress - permissible shear stress.

3.9 Methods of providing shear reinforcement in the form of vertical stirrups - combination of vertical stirrups and bent up bars.

3.10 Code provisions for spacing of stirrups and minimum shear reinforcement (no derivation of equations).

3.11 Development of bond stress in reinforcing bars.

3.12 Design bond stress - development length – bond and anchorage concepts and their importance.

3.13 Curtailment of tension reinforcement.

3.14 Simple problems on development length.

3.15 Design of simply supported singly and doubly reinforced rectangular beam for flexure including shear and check for deflection using stiffness criteria - Use of design aids (SP-16).

3.16 Design of an independent lintel subjected to triangular loading.

4.0 Design of slabs

4.1 Slabs as structural and functional members

4.2 One way and two way slabs

4.3 Minimum reinforcement and maximum spacing of reinforcement – concrete cover - stiffness criterion-stiffness ratios for simply supported, cantilever and continuous slabs.

4.4 One way and two way slabs with various end conditions as per I.S:456 code.

4.5 Design of one-way slab for flexure and shear for the given grades of concrete, steel, span and loading.

4.6 Check for deflection using simplified approach of stiffness criteria.

4.7 Design of two-way slabs with different end conditions, using B.M coefficients for the unrestrained and restrained conditions as per code.

4.8 Design of torsion reinforcement for the restrained slabs - Deflection check using stiffness criteria - Use of design aids (SP-16).

4.9 Detailing of reinforcement in stairs spanning longitudinally.

5.0 Analysis of T-beam

5.1 Conditions needed for design of a beam as T-Section–advantages - Code provisions for effective flange width - three cases of T- beams.

5.2 Neutral axis, lever arm and moment of resistance for under reinforced, balanced sections using the equations given in the code (no derivations).

5.3 Calculation of the moment of resistance of tee section using the equations given in the code – Use of design aids (SP16).

6.0 Design of Continuous beams and Slabs

6.1 Behaviour of continuous members and advantages of continuous beams and slabs.

6.2 Determination of B.M and S.F of continuous beams and slabs of minimum three spans using BM & SF coefficients given in the code-Use of design aids (SP-16).

6.3 Design the tension reinforcement at a given section only.

7.0. Design of columns

7.1 Definition of column – Difference between Column and Pedestal.

7.2 Types of columns (Long and Short) - effective length for different end conditions.

7.3 Code provisions for design of columns- square, rectangular and circular columns with lateral ties

7.4 Determination of Load carrying capacity of short column (subject to axial load only).

7.5 Design of short square, rectangular and circular columns (with lateral ties only).

8.0 Design of Footings

8.1 Footings - Need for footings

8.2 Footings under isolated columns – loads on footings

8.3 Code provisions for design of footings - size of footings for given bearing capacity

8.4 Design of an isolated square footing of uniform thickness under a column

8.5 Checking of the footing for one-way shear, two-way shear, bearing stress and for development length.

REFERENCE BOOKS

1. *„Limit state design of R.C.C structures‟* by Ashok K.Jain, Nem chand brothers, Roorkee.

‗Limit state Design of concrete structural elements', continuing Education module prepared by N.I.T.T.T.R Chennai and published by I.ST.E continuing education cell, university Visveswaraiah College of Engineering, (UVCE)Campus, Palare Road, Bangalore – 560001.

3. Structural Engineering(RCC) by Ramamrutham.

4. Structural Engineering (RCC) by Vazirani and Ratwani.

5 R.C.C Structural Engineering by Guru charan Singh.

6 Reinforced Concrete Structures by I.C.Syal and A.K.Goyal

7 Limit state design of reinforced concrete by P.C. Verghese

8 Concrete technology and practice by M.S Shetty

9 SP:34 - Handbook on concrete reinforcement and detailing.

10 Structural Design & Drawing by N. Krishna Raju

(Universities press)

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Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: DIPLOMA

Faculty Name: S.SURYA PRAKASH

Class	Semester	Name of The Subject	Subject Code	W.E.F
II DCE	IV SEMESTER	IRRIGATION ENGINEERING	C-402	14-11-2018

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
90 Hours	Theory 6	Practical	3	Internal 20	External 80	

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable development

Development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

Diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in

Independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1 Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.

PSO2 Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1. To know the necessity of irrigation and scope of irrigation

2. To know the basic concepts of hydrology and and characteristics of catchment areas

3. To know the basic idea about reservoirs, gravity dams and earth dams

Course Outcomes:

1. Determines the types of irrigation and duty figures for principal crops.
2. To know the methods of measurement of rainfall using rain gauges.
3. To understand the head works for a diversion scheme and protective works for resisting percolation.
4. To have the better knowledge in the basic ideas about reservoirs ,gravity dams and earth dams.
5. To have an about the canals and cross masonry works.

6. To understand the soil erosin, water logging and river trainng works.

UNIT-I

1.0 Understand the Nature and scope of Irrigation

1.1 Define Irrigation

1.2 Understand the necessity of irrigation.

1.3 List advantages of irrigation.

1.4 List disadvantages of irrigation

1.5 State different types of irrigation

1.6 Explain Perennial Irrigation

1.7 Explain Inundation Irrigation

1.8 Distinguish between

Perennial and inundation irrigation,

Flow and Lift irrigation, and

Storage and Direct irrigation.

1.9 State Principal crops in India and their seasons

1.10 Explain Kharif crops

1.11 Explain Rabi Crops

1.12 Define the following terms

UNIT-II

Understands the basic concepts of Hydrology

2.1 Explain the term Precipitation

2.2 State different types of rain gauges

2.3 Describe Simon's rain gauge

2.4 Explain the method of measurement of rainfall using Simon's Rain gauge

2.5 Explain the method of measurement of rainfall using float type automatic rain gauge

2.6 Explain precautions in setting and maintenance of rain gauges

2.7 State uses of rain fall records

2.8 Describe Hydrological cycle

2.9 Explain method of average annual rainfall of an area by Theisson's Polygon method

2.10 Solve the problem on calculation of average annual rainfall by Theisson's Polygon method

2.11 Define the following:

Catchment,

0 Intercepted catchment,

Free catchment and

Combined catchment area

2.12 State the characteristics of

Good catchment,

Average catchment and

.Bad catchment

2.13 Explain the term Run-off

2.14 Explain factors affecting runoff

2.15 Understand nature of catchment and runoff coefficient

2.16 Explain methods of estimating runoff using empirical formulae

2.17 Solve the problems on estimating run-off

2.18 Understand the term maximum flood discharge

2.19 Explain the methods of determining maximum flood discharge

2.20 State Ryve‘s and Dicken‘s Formulae

2.21 Solve simple problems on estimating maximum flood discharge

2.22 Explain the importance of river gauging

2.23 Lists the factors for selecting suitable site for a gauging station

UNIT-III

Understands the head works for a diversion scheme and protective works for resisting percolation

3.1 Classify head works

3.2 State the suitability of different types of head works under different conditions

3.3 State the factors for selecting suitable site for diversion head works

3.4 Describe the component parts of Diversion works with sketch

3.5 Describe with sketch the component parts of a weir

3.6 Distinguish between barrage and Weir

3.7 Describe head regulator with sketch

3.8 Describe scouring sluice with sketch

3.9 Describe flood banks and other protective works

3.10 Define the following terms:

Percolation,

Percolation gradient,

Uplift and

4.Scour.

3.11 Explain percolation gradient

3.12 Explain uplift pressure

UNIT-IV

Understands the basic ideas about reservoirs, gravity dams and Earth dams

4.1 Distinguish between Rigid dams and Non-rigid dams

4.2 State factors influencing selection of site for reservoirs and dams.

4.3 Define the terms:

Full reservoir level,

Maximum water level,

Top bund level,

Dead storage,

Live storage,

Free board,

Gravity dam and

Spillway.

4.4 Explain the causes of failure of gravity dams and their remedies.

4.5 Distinguish between low and high dams.

4.6 Draw the elementary profile of a gravity dam for a given height

4.7 Draw the practical profile of a low dam.

4.8 Explain uplift pressure

4.9 Explain need for drainage galleries with sketches

4.10 Explain construction and contraction joints with sketches

4.11 State need and types of grouting of foundations

4.12 State different types of spillways and their suitability and draw sketches

4.13 State the situations in which earth dams are suitable

4.14 State the three types of earth dams with sketches of typical cross sections

4.15 Explain causes of failure of earthen dams and their precautions

4.16 Explain the terms with sketches

1. Saturation gradient and

.

UNIT-V

Understands the basic ideas about canals & cross masonry works

5.1 Classify canals.

5.2 State the different methods of canal alignment and the situations in which each is suitable.

5.3 Sketch typical cross sections of canals

In cutting,

Embankment and

Partial cutting.

5.4 Explain balanced depth of cutting and its necessity

5.5 State the need for canal lining

5.6 State advantages of canal linings

5.7 State disadvantages of canal linings

5.8 Explain different types of canal linings

5.9 Explain the maintenance required for canals and their regulation

5.10 State different types of cross masonry works (cross regulator, drainage & Communication) and their objectives.

5.11 State need for cross drainage works

5.12 Describe the following with sketches

Aqueduct,

Super passage,

Under tunnel, siphon,

Level crossing and

Inlet and outlet

UNIT-VI

Understands the soil erosion, water logging and River training works

6.1 Explain terms:

Soil erosion,

Reclamation, and

Water logging.

6.2 State causes of soil erosion

6.3 State ill effects of soil erosion

6.4 Explain various methods of prevention of soil erosion.

6.5 State causes of water logging

6.3 State ill effects of water logging

6.4 Explain various methods of prevention of water logging

6.5 State methods of land reclamation.

6.6 State different stages of flow of rivers

6.7 Explain characteristics of Delta Rivers

6.8 Explain term meandering of river

6.9 State objectives of river training works

UNIT-VII

Understands the principles of water management

7.1 State soil-water plant relationship.

7.2 Describe the following irrigation methods:

Broader irrigation,

Check basin irrigation,

Furrow irrigation,

Sprinkler irrigation and

Drip irrigation

7.3 Explain on farm development

7.4 Describe 1. Warabandi system and 2. Water user associations

7.5 State the duties of water user associations

UNIT-VIII

Understands the basic ideas about watershed management

8.1 Explain the concept of

Water shed and

Water shed management

8.2 State the need for watershed management

8.3 List the objectives of watershed management

8.4 State need for watershed development in India

8.5 Describe different approaches to water shed management

8.6 Explain the methods of Rain water harvesting

8.7 Explain method water harvesting through check dams

8.8 Explain different methods of artificial recharge of ground water

8.9 Explain artificial recharges of ground water using percolation tanks

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Program Name: B.Tech Faculty Name: P. VINAY

Class	Semester	Title of The Subject	Subject Code	W.E.F
II	II	Transportation Engineering -I	C-404	14-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
	Theory	Practical		Internal	External	
60 Hours	06		3	30	70	3

Programme Outcomes:

PO1: Engineering Knowledge: Apply knowledge of mathematics and science, with fundamentals of Computer Science & Engineering to be able to solve complex engineering problems related to CSE.

PO2: Problem Analysis: Identify, Formulate, review research literature and analyze complex engineering problems related to CSE and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3: Design/Development of solutions: Design solutions for complex engineering problems related to CSE and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.

PO4: Conduct Investigations of Complex problems: Use research–based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to computer science related complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the CSE professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the CSE professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply Ethical Principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Objectives:

1. Learn Basic knowledge on various highway developmental engineering surveys, drawings, reports and highway networks.
2. Study the design geometry of highways
3. Learn concepts of conducting traffic surveys and design of intersections & signals
4. Learn various tests conducted on Highway materials like bitumen, aggregates
5. Study the design principles of Highway pavements
6. Learn the construction procedure and maintenance of highways

Course Outcomes:

1. Plan the highway network for a given area based on engineering surveys
2. Design highway geometrics
3. Develop the intersections and signals in required area based on traffic surveys
4. Judge suitability of pavement materials for the construction of roads.
5. Design flexible and rigid pavements
6. Construct & maintain the highways

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Program Name:DIPLOMA
Faculty Name:SK SHAJAHAN

Class	Semester	Name of The Subject	Subject Code	W.E.F
IIDCE	IV SEM	CONSTRACTION PRACTICE	C-405	14-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 04	Practical	3	Internal 40	External 60	

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in

independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.
PSO2	Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1.To give knowledge regarding classification of buildings and foundations and structural elements .

2.To give knowledge regarding shuttering, scaffolding, finishes, and green building.

Course Outcomes:

1. Identify the classification of buildings and foundations.
2. Identify masonry and its types
3. Recognize types and parts of doors,windows,lintels
4. Recognize roofs, floors ,stair cases.
5. Understand the different types of finishers of buildings
6. To know the Green buildings and energy management.

1. Classification of Buildings and foundations

0 Component parts of a building –Their functions.
1 Classification of buildings according to National building code.
2 Site investigation for foundation as per N.B.C, Trial pit, auger boring.
3 Spread footing foundation for columns and walls.
4 Raft foundation.
5 Pile foundation – RCC Piles – Bearing piles, friction piles and under reamed pile.
6 Well foundation – component parts – sinking of well foundation.

7 Different loads to be considered for the design of foundation as per IS 875 – 1987.

8 Spread foundation – Depth of foundation by Rankine's formulae– width of foundation – Thickness of concrete bed.

9 Construction of foundation (spread footing foundation only).
10 Causes, effects and prevention of dampness at basement level.

2. Masonry

0 Classification of stone masonry – Ashlar, Random rubble and Coursed Rubble Masonry – general principles to be observed while constructing stone masonry

1 Brick Masonry – Bonds in brick masonry – (English bond only) for one brick wall thicknesses – General principles to be observed in construction of brick masonry.

1 Masonry with Precast concrete solid blocks, Hollow blocks, high quality building blocks with sketches.

3. Doors, Windows, Lintels and Sunshades

0 Doors and windows – parts of door and window – positioning.
1 Common types of doors-panelled, Glazed and Flush doors.

2 Special types of doors – Flush doors with modern construction materials, revolving doors, collapsible doors, rolling shutters, sliding doors- referring to A.P.D.S.S for size of doors and windows.

3 Windows – Panelled and Glazed.
4 Ventilators – fixed, swinging type and louvered.
5 Fittings and fastenings for doors, windows and ventilator.
6 Lintels – Functions – Types of lintels – R.C.C., wood, stone and steel.
7 Sunshade, canopy and sun breakers – lintel cum sunshade.

4. Roofs and Floorings and staircases

0 Roof – functions of roofs.
1 Classification of roofs – flat roofs – pitched roofs.

2 Different types of trusses – classification based on material and shape - King post truss, Queen post truss, Fan roof truss, North light roof truss.

3 Weather proof course on R.C.C. roof.

4 Common and decorative ceilings for auditoriums – method of fixing Plaster of Paris –Fibre glass.

5 Parts of flooring – Requirements of a good floor.

6 Methods of constructing flooring – cement concrete flooring, cement plaster flooring, Tiled flooring, mosaic flooring and Marble flooring.

7 Location of stairs.
0 Terms in stairs.

8 Types of stairs – straight, Quarter turn, half turn, Dog legged, open well, bifurcated, spiral/helical stair case, free standing and slab less stairs/staircase.

5. Staging, Shuttering and Scaffolding,

0 Staging- concept

1 Scaffolding – Purpose and types – component parts and advantages of tubular scaffolding only.

2 Shuttering/Form work – objectives

6. Protective, decorative finishes and Termite proofing

0 Plastering – purpose – Types of plastering – procedure for plastering.
External finishing – sand faced, pebble dash, acoustic plastering and marble chips

– Internal finishing – wall paper and wall putty finishing.

1 Pointing – purpose –Types of pointing

2 Painting – objectives – method of painting new and old wall surfaces, wood surface and metal surfaces – powder coating and spray painting on metal surfaces.

3 White washing – colour washing – Distempering – internal and external walls.
4 Termite proofing – method.

7. Energy Management and Energy Audit of Buildings

0 Introduction to Energy Management and Energy Audit of Buildings.
1 Aims of energy management of buildings.
2 Types of energy audit.
3 Response energy audit questionnaire.
4 Energy surveying and audit report.

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Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name:DIPLOMA
Faculty Name:P.P.MUNINDRA

Class	Semester	Name of The Subject	Subject Code	W.E.F
II DCE	IV SEMESTER	CIVIL ENGINEERING DRAWING-II	C-406	14-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 04	Practical	3	Internal 40	External 60	

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in

independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.
PSO2	Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1.To provide knowledge regarding structural planning of a building and marking of frame components.

2.To provide knowledge regarding detailed working Drawings of R.C.C , Read and interpret the R.C.C

Course Outcomes:

1. Student should be able mark the building components
2. Student should draw the various sections of various R.C.C building components.
3. Student should prepare bar bending schedule for various structural drawings.

UNIT I **Structural planning of a building and marking of Frame components**

1.1 Draws the position of columns, beams, slabs, stairs and footing in a given line diagram of building

1.2 Prepare member reference scheme of given building following Column reference scheme & Grid reference scheme as per IS: 5525 – (recommendations for detailing of reinforced concrete works). & SP:34

UNIT II **Detailed working Drawings of**

2.1 Singly reinforced simply supported rectangular beam.

2.2 Lintel cum sunshade.

2.3 Simply supported one-way slab.

2.4 Two-way slab simply supported corners not held down.

2.5 Two-way slab simply supported corners held down.

2.6 One-way continuous slab and T-beam (with details of slab and T-beam)

2.7 Column with uniform thick and sloped footings.

2.8 Stair case – stairs spanning longitudinally (Dog legged stair case)

UNIT III **Read and interpret the Drawings**

3.1 Preparation of Schedule of reinforcement for a given structural Drawing

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Program Name: DIPLOM Faculty Name: S.SURYA PRAKASH

Class	Semester	Name of The Subject	Subject Code	W.E.F
II DCE	IV	AUTOCAD LAB	C-407	14-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
90 periods	Theory	Practical 06	3	Internal 40	External 60	

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in

independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.
PSO2	Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1.To give knowledge regarding applications and advantages of cad.

2.To give knowledge about plans,drawings of residential buildings.

Course Outcomes:

1. Students should know the geometric constructions and components of building drawings
2. They should know how to draw plan,section and elevation of residential buildings using Auto CAD commands.

3.To know about standard drawings for municipal approval.

LIST OF EXPERIMENTS:

1. **Introduction and Practice on computer aided drafting (CAD)**
2. 1.1 Computer graphics
3.

1.2 Definition of CAD

1.3 Applications of CAD

1.4 Advantages of CAD

1.5 Introduction to Auto CAD as Drafting package

1.6 Study of drawing editor screen

1.7 List out methods to access Auto CAD commands.

1.8 Practice of setting up of drawing area using utility commands, & using setting commands.

1.9 Practice of entity draw commands.

1.10 Draw the given geometrical figures using draw commands.

1.11 Dimension the figures using dimensioning commands.

1.12 Practice of Modify commands.

1.13 Practice of construct commands.

1.14 Practice of edit commands

1.15 Practice of view commands.

1.16 Practice of Hatch commands.

1.17 Practice of insert commands.

2 Employ CAD software commands to prepare Geometric Constructions and drawings related to Building components.

2.1 Divide a given line into desired number of equal parts internally.

2.2 Draw tangent lines and arcs

2.3 Construct a hexagon from the given data.

2.4 Construct ellipse, parabola, hyperbola, cycloid, and helix.

2.5 Draw conventional signs as per I.S. standards, symbols used in civil engineering drawing.

2.6 Draw the important joinery components of the building like elevation of fully panelled double leaf door, elevation of partly glazed and partly panelled window.

2.7 Draw the important building components like section of a load bearing Wall foundation to parapet.

3.0 Residential buildings

3.1 Plan, Elevation, Section of single roomed building

3.2 Single storied load bearing type residential building

3.2.1 One bed Room House

3.3 Single storied framed structure type residential building

3.3.1 One bed Room House

4.0 Structural detailing drawings

4.1 Singly reinforced simply supported rectangular beam.

4.2 Lintel cum sunshade

4.3 Continuous Beam.

4.4 Simply supported two way slab.

4.5 Isolated Column with square footing

5.0 Drawings to be submitted for approval to corporation or municipality showing required details in one sheet such as

5.1 Plan – Showing Dimensions of all rooms

5.2 Section – showing Specifications and Typical Foundation Details

5.3 Elevation

5.4 Site Plan – Showing Boundaries of Site and Plinth Area, Car Parking, Passages and location of Septic Tank

5.5 Key plan – Showing the location of Building

5.6 Title Block – Showing signature of Owner & Licensed surveyor

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Program Name: DIPLOMA   Faculty Name:G.SIRISHA

Class	Semester	Name of the Subject	Subject Code	W.E.F
II DCE	IV	COMMUNICATION SKILLS	C-408	14/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
	Theory	Practical		Internal	External
45 Hours		3	3	40	60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The CIVIL Engineering Diploma Students acquire structural and managerial skill that make them an employable graduate.

PSO 2: The civill Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1. Understand and strengthen their listening skills.

2. Understand and strengthen their speaking skills.

Course Outcomes:

CO1 : Understand the abilities of communication.

CO2: Understand and improve the opportunity for practicing speaking.

Content

Topic	**Teacher's input/ methodology**	**Students competence**
Listening I Listening II	Pre- Listening –eliciting, pictures While - Listening Post –Listening –project , writing	Identifying the main idea, Identifying specific details, Identifying parallel and contradictory ideas Drawing inferences, Reasoning
Introducing oneself	Kinds of introduction --official/ personal, dynamic vocabulary, Body language, Model introduction, Use of line ups	Use of simple present tense, Sequencing, Appropriate vocabulary
Reporting incidents	Group work /pair work, Elicit, Use of past tense, Student presentations	Use of past tense, Relevant vocabulary
Describing objects	Vocabulary , Use of adjectives, Games—I spy, Group presentations	Use of adjectives, Dimensions,shapes Compare and contrast, Sequence
Describing events	Group work/pair work Use of appropriate tense	Use of appropriate tense, Sequencing
Reporting past incidents	Use of past tense, Vocabulary Student presentations	Use of past tense , sequencing
Speaking from observation/rea ding	Group work/pair work, Reading techniques ,	Use of past tense, Summarising , evaluating, comprehension

JAM	Effective techniques , Good beginning , conclusion, tips, Use of line ups	Vocabulary, Sequencing, Fluency, Thinking spontaneously
Group discussion	Expressing opinion, body language,	Expressing opinion, agree/ disagree, fluency,Persuasive and leadership skills
Mock interview	FAQs , body language	Role play, body language,
Making presentations	Student presentations	Using charts , pictures, interpreting data, sequencing,PPTs

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Program Name: CIVIL Faculty Name:P. VINAY

Class	Semester	Title of The Paper	Paper Code	W.E.F
III CIVIL	II	Design of Steel Structures	C-501	14/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 6	Practical ----	3 Hours	Internal 30	External 70	3

Programme Outcomes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

1. Knowledge of contemporary issues in the civil engineering industry to solve societal issues.
2. Qualify in competitive examinations for higher education and employment.

Course Outcomes:

1. Define the basic elements of a steel structure and fundamentals of structural steel fasteners.
2. Design basic elements of steel structures (beams)
3. Design tension members, compression members and Roof trusses.
4. Design columns both laced and battened.
5. Design column bases. (Both gusset and slab bases)

Course Objectives:

1. To introduce steel structures and its basic components, and introduce structural steel fasteners like welding and reviting.
2. To design beams (laterally supported, unsupported and build up sections)
3. To design tension members, compression members and roof trusses
4. To design beam-columns both laced and battened
5. To familiarize students with column bases and their design.

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Program Name: **DIPLOMA** **Faculty Name:** **S.G.S.PRIYANKA**

Class	Semester	Name of the subject	Subject Code	W.E.F
III	VI	CONSTRUCTION TECHNOLOGY AND PROJECT MANAGEMENT	C-502	14/11/18

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
Hours 75	Theory 5	Practical	3 HOURS	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1:	Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.
PSO2:	Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1. Able to know the different technologies adopted in concrete structure and different machineries used in the field of construction.

2. Know the full details about contracts and tenders involved and have a idea on PERT & CPM methods.

Course Outcomes:

1. Understand the concrete Technology.
2. Explain the uses of different construction equipment.
3. Understand the Buildings services.
4. Know the objectives of Preliminary planning and organisational aspects.
5. Understands Constructional Planning, Contracts and tender systems and Methods of execution of works, payments & stores.
6. Understands the Basic concepts & opportunities of entrepreneurship.

COURSE CONTENT

UNIT-1 Concrete Technology

1.1 Introduction – Ingredients of Concrete – Properties of Concrete – Workability-Factors influencing workability –Water/Cement Ratio-Relation between Strength of concrete and Water/Cement Ratio.

1.2 Curing of Concrete-Methods of curing.

1.3 Grade of concrete--Normal strength concrete and High strength concrete, factors affecting variability of concrete strength.

1.4 Special Concretes – fiber reinforced Concrete – Fal G-Concrete, high density Concrete, Light weight Concrete, polymer Concrete and micro Concrete – Self Compacting Concrete-Properties – uses.

1.5 Concreting under special exposure condition – cold weather Concreting – hot weather Concreting – under water concreting – Shotcrete – Concreting in high rise buildings - Micro concrete – Shotcrete.

UNIT-2 Construction machinery and equipment

2.1 Need for use of construction Machinery.

2.2 Factors affecting selection of equipment.

2.3 Types – Crawler and Pneumatic tyred.

2.4 Excavation equipments – Tractors, Bulldozer, Grader, Scrapper, Shovel, Dragline, Clamshell, Dredgers – description-Uses.

2.5 Compaction equipments – Rollers, Tamping roller – Smooth wheeled roller – Pneumatic tyred rollers – Vibrating compactors – Description – uses.

2.6 Hauling equipments – Trucks, Dump trucks, Dumpers.

2.7 Cranes –Tower cranes.

2.8 Conveying equipments – Belt conveyors.

UNIT-3 Building Services

1.1 Lighting requirements in a building – precautions to be taken to avoid glare in building – glare – daylight factor.

3.2 Electrical services – Requirements of good electrical wiring – types of electrical wirings – earthing – methods.

3.3 Ventilation – Requirement of good ventilation – Natural and Artificial ventilation

3.4 principles of fire protection in buildings - causes of fire - fire fighting – fire detectors - fire extinguishers - fire resistant building materials.

3.4 Air conditioning – Purpose – Air conditioning layout – Components –Types of cooling systems – Air coolers – Air conditioner – Centralized Air conditioner – Split type Air Conditioner.

3.6 Safety alarm system in buildings- necessity.

3.7 HVAC system in residential buildings- Concept.

UNIT-4 Preliminary Planning & Organisational aspect

4.1 Construction Management –definition-need for construction Management factors involving construction management.

4.2 Importance of planning-site investigation-feasibility report and project report - collection of data and preparation of project report.

3.7 Aspects to be considered during preliminary planning - Minor irrigation project, road project, rural water supply project, housing colony, rural hospital.

4.4 Different organisations of engineering department –Organisational structure of I and CAD, Roads and Buildings, Panchayat Raj and Public Health departments P.W.D., duties of various officers – AE/AEE, DEE, EE & SE - administrative approval and technical sanction.

UNIT-5 Construction Planning, Contracts & Tenders

5.1 Construction stage-construction operation - need for material schedule and labour schedule - procurement of labour, material and equipment -Bar chart - safety measures in construction - critical path method -preparation of net work diagram – Problem - critical path.

5.2 Terms: Contract and contractor - Legality of contracts – types of contracts – piece work – contracts –lumpsum contract – item rate contract – percentage contract – Negotiated rates –merits and limitations of each contract system

5.3 Necessity of tenders – sealed tenders – tender notice – tender documents – Earnest Money Deposit and Security Deposit – Opening of tenders – scrutiny of tenders – Comparative Statement – Acceptance of tenders, work order –contract agreement.

UNIT-6 Execution of Works, payment of bills & stores

6.1 Regular and work charged establishment – inspection of works - need and methods of quality control - necessity for sampling and testing of materials.

6.2 Departmental execution of works- Muster roll -Imprest .

6.3 Labour laws and minimum wages act- Importance- brief explanation.

6.4 Measurement book-rules to be followed in recording measurement-premeasurements and check measurement – contractors acceptance of measurements-preparation of bill-Types of hand receipts – modes of paymentchecking of bills–-recoveries to be made from bills

6.5 Classification of stores-general stock items- consumables and non consumablesissue of stores-material-receipts-issues –transfer entry order-materials at site account-Indent-invoice–stock register-issue rate-verification of stores-accounting of shortages and surplus – write off.

UNIT-7 Concept & opportunities of Entrepreneurship in civil engineering

7.1 Licenced surveyor, contractor, consultancy and contract services in building construction,

7.2 Significance and Concept of Small business enterprise-Assistance Programme for Small Business enterprises - Assistance provided by different institutions such as NISIET, SISI, NSIC,APIDC –Role of Banks in the development of Small Business Enterprise such as APSFC, Nationalised Bank.

7.3 various concessions given to civil Engineer to start on enterprise and execute contracts.

REFERENCE BOOKS

1. Concrete Technology M S Shetty
2. Hand book on Design of Concrete mixes S.P.23
3. Enterprenenuership and construction Management P.Venkataiah
4. Entreprenuership and construction Management N. Sreenivasulu
5. Construction Management and Accounts V.N Vazirani
6. Construction Management and Accounts Sharma
7. Management in Construction industry P.P Dharwadekar

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Program Name: DIPLOMA FacultyName:S.NAGALAKSHMI

Class	Semester	Name of the Subject	Subject Code	W.E.F
III DCE	V	ENVIRONMENTAL ENGINEERING	C-503	14/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory 6	Practical	3	Internal 20	External 80

Programme Outcomes:
1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.
2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.
3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.
4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.
5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.
6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.
7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.
9. Communication: An ability to communicate effectively.
10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:
PSO 1: Applying concepts and solving problems in the branches of civil engineering such as structural, Environmental,Hydraulics, Construction Management and Geo technical Engineering
PSO 2:Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of civil engineering.

Course Objectives:
1. Understand the Quality as per IS code and methods of purification of water
2. Understand the systems of distribution and Water supply arrangements in Buildings

Course Outcomes:
CO1 : Appraise the quantity of water required for a community
CO2:List with types of intakes
CO3 :Examine the water characteristics
CO4 : Discuss the Primary treatment of raw water

CO5: Identify the Miscellaneous treatments

CO6: Describe the distribution network.

COURSE CONTENT:
1.0 Introduction to Water Supply Scheme and Quantity of water
1.1General importance of water supply.
1.2Development of Water supply.
1.3Need for protected Water supply.
1.4Flow chart of a typical water supply scheme.
1.5Total quantity of water for a town, per capita demand and factors affecting demand.
1.6Water requirements for domestic purposes, industrial use, fire fighting,commercial and institutional needs, public use.
1.7Variation in demand - peak demand – seasonal, daily and hourly variation.
1.8Forecasting population by arithmetical, geometrical and incremental increase methods-problems on above methods.
2. Sources and Conveyance of Water
2.1Surface source- Lakes, streams, rivers and impounded reservoirs.
2.2Underground sources-springs, wells, infiltration wells and galleries.
2.3Yield from wells by constant pumping and recuperation tests. (No problems required)
2.4Comparison of surface and subsurface sources.
2.5Quality and Purification of water.
2.6Types of intakes:
(i) Reservoir intake;
(ii) River intake;
(iii) Canal intake.
(iv) Lake intake.
2.7Conveyance of water-open channels, aqueduct pipes.
2.8Pipe Materials - C.I Pipes, Steel Pipes, concrete pipes, A.C. Pipes,G.I. Pipes Plastic Pipes (PVC &HDPE), merits and demerits of each type.
2.9Pipe joints - spigot and socket joint, flange joint, expansion joint for C.I. Pipe, joints for concrete and asbestos cement pipes.
3.Pipe Laying and testing-Leak detection

3.1Impurities of water - need for laboratory test – sampling- grab and composite sampling.
3.2Tests of water - physical, chemical and bacteriological tests – p H value of water.
3.3Standard quality for domestic use and industrial purposes.
3.4Flow diagram of different treatment units.
3.5Aeration - methods of aeration.
3.6Sedimentation - plain sedimentation and sedimentation with coagulation.
3.7Filtration - Construction and operation of slow sand & rapid sand filters.
3.8 Disinfection of water - necessity and methods of chlorination , pre-chlorination, break point chlorination

3.9Hardness – Types of Hardness
NOTE: No design of treatment units
4.Distribution system and water supply arrangements in a Building.
4.1General requirements, systems of distribution - gravity system, combined system, direct pumping.
4.2Methods of supply - Intermittent and continuous.
4.3Storage - underground and overhead-service reservoirs - necessity.
4.4Types of layout - dead end, grid, radial and ring system
4.5Location and functioning of:
(i) Sluice valves.
(ii) Check valves or reflux valves.
(iii) Air valves.
(iv) Drain valves or blow-off valves
(v) Scour valves.
(vi) Fire Hydrants.
(vii) Water meters.
4.6Water supply arrangements in building:Definition of terms; water main, service pipe communication pipe,supply pipe, distribution pipe, air gap.
4.7General lay-out of water supply arrangement for single and multi- storeyed buildings as per I.S Code of practice-general principles and precautions in laying pipelines within the premises of a building.
4.8Connections from water main to building with sketch.
4.9Water supply fittings, their description and uses - stopcock, ferrule,goose neck etc.
5.Introduction and Quantity of Sewage
5.1Object of providing sewerage works.
5.2Definition of terms : sullage, sewage, sewer and sewerage – classification of sewage.
5.3Types of sewerage systems and their suitability – separate, combined and partially separate systems.
5.4Quantity of discharge in sewers, dry weather flow, factors affecting dry weather flow , variation in rate of sewage
5.5Determination of storm water flow – run off co-efficient, time of concentration, rational method and empirical formulae for run-off.
5.6Surface drainage - requirements, shapes of surface drains.
5.7Simple problems on design of sewers (running half full only) using Manning‘s and Hazen Williams formulae .
6.0 Laying of Sewers and Sewer Appurtenances
6.1Different shapes of cross section for sewers – circular and non-circular – merits and demerits of each.
6.2Brief description and choice of types of sewers - stone ware, cast iron, cement concrete sewers and A.C Pipes.
6.3Laying of sewers - setting out alignment of a sewer, excavation, checking the gradient , preparation of bedding, handling, lowering, laying and jointing, testing and back filling.
6.4Brief description, location, function and construction of
i)Manholes.
ii)Drop manholes.
iii)Street inlets.
iv)Catch basins.
v)Flushing tanks.
vi)Regulators.
vii)Inverted siphon.

7.0Sewage Characteristics

7.1Strength of sewage, sampling of sewage, characteristics of sewage; physical, chemical and biological.

7.2Analysis of sewage - significance of the BOD test.

7.3Characteristics of Industrial waste water–principles of treatment, Reduction of volume and strength of wastewater, Equalization, Neutralization and proportioning.

7.4Preliminary treatment - Brief description and functions of following units.
i)Screens, (ii) Skimming tanks and (iii) Grit chambers.

7.5Primary treatment - Brief description and functions of Plain sedimentation, simple problems on the design of sedimentation tanks.

7.6Secondary treatment - Brief description of
i)Trickling filters (ii) Activated sludge process

7.7Sludge digestion – Process and methods of sludge disposal.

7.8Miscellaneous treatments- septic tank.- design of septic tank.

8.0 Sanitation in Buildings

8.1Aims of building drainage and its requirements – General layout of sanitary fittings to a house - drainage arrangements for single and multi storied buildings as per IS code of practice-plumbing systems.

8.2Sanitary fittings – traps, water closets, flushing cisterns, urinals, inspection chambers, anti siphonage - Inspection, testing and maintenance of sanitary fittings.

REFERENCE BOOKS

1.Environmental Engineering	G.S. Birdie
2.Elements of Public Health engineering	K.N. Duggal
3.Environmental Engineering	Baljeet Kapoor
4.Public Health Engineering	S.K. Hussain
5.Environmental Engineering	Ramachandraiah
6.Water supply and sanitary Engineering	V.N. Vazirani
7.Environmental Engineering	N.N.Basak/TMH

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Kothapet, VIJAYAWADA-520 001

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO
COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name:DIPLOMA
Faculty Name:SK SHAJAHAN

Class	Semester	Name of The Subject	Subject Code	W.E.F
IIIDCE	VI SEM	GEO TECHNICAL ENGINEERING	C-504	14-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 04	Practical	3	Internal 40	External 60	

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in

independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1 Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.

PSO2 Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1.To give knowledge regarding soil mechanics with various difficulties, to give knowledge regarding various properties of soils .

2.To give knowledge and applications of mechanical and engineering properties of different soils.

Course Outcomes:

1. Illustrate the classification of Soils.
2. Identify purpose of soil exploration
3. Identify the essential properties of soils
4. Recognize the hydraulic and mechanical properties of soils
5. Understand the basic principles of bearing capacity of soils
6. Understand the basic concepts of consolidation of soils.

1.0 General characteristics of Soils

1.1 Soil mechanics – its importance

1.2 Types of soils – Residual soil, Transported soil, sand, silt, clay, peat, loess, murram, caliche, , bentonite – soils in India

1.3 Mechanical analysis of soils – Hydrometer and sieve analysis of soil particles – semi logarithmic grain size curve

1.4 Physical properties of soils – plasticity, cohesion, consolidation

2.0 Soil Exploration

2.1 Soil exploration – need for soil exploration – methods of soil exploration – Sub soil and ground water exploration - a brief overview

3.0 Essential properties of soils

3.1 Preparation of disturbed soil samples for testing – soil moisture content – oven drying method - soil plasticity

3.2 Atterberg's Limits - liquid limit, Plastic Limit, Shrinkage Limit – tests for determination of Atterberg's Limits – plasticity index

3.3 Specific gravity of soil particles – pycnometer method

3.4 Definitions and relationships of volume of voids, moisture content, density of soil mass, dry density , saturated density, submerged density, specific gravity, void ratio, porosity, degree of saturation, percentage of air voids, air content, density index, - simple problems using the above relationships

4.0 Classifications of Soils

4.1 Classification of soils –different systems of classification of soils – textural classifications of soils – I.S. classification of soils

5.0 Hydraulic and Mechanical Properties of Soils

5.1 Permeability of soils

5.2 Compressibility of soils

5.3 Shearing resistance of soils – shear strength experiment with Direct sheratus. (Explanaion of testing procedure onl

6.0 Bearing Capacity of Soils

6.1 Bearing capacity – definition – importance of bearing capacity in foundation design – bearing capacity of shallow footings

6.2 Importance of factor of safety – safe bearing capacity values in foundation design

6.3 presumptive bearing capacity values – code equation for computing bearing capacity (No derivation) - field plate load test

7.0 Settlement of Foundation

7.1 Settlement – definition – vertical pressure in soil beneath loaded areas – foundation settlement

7.2 Importance of bearing capacity and settlement in building foundations (qualitative treatment only)

8.0 Consolidation of Compressible Soils

8.1 Consolidation – definition- Terzaghi's model analogy of compression/ springs

showing the process of consolidation – field implications

9.0 Compaction of Soils

9.1 Theory of compaction – compaction and its objectives – factors affecting compaction

9.2 Laboratory compaction tests – Proctor's compaction test – Modified Proctor compaction test

9.3 Field measurement of compaction by core cutter method and sand replacement method – California Bearing Ratio – definition and its importance in the design of pavements

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Program Name: DIPLOMA
Faculty Name: S.SURYA PRAKASH

Class	Semester	Name of The Subject	Subject Code	W.E.F
III DCE	V SEMESTER	ADVANCED CIVIL ENGINEERING TECTHNOLOGIES	C-505	14-11-2018

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
90 Hours	Theory 6	Practical	3	Internal 20	External 80	

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable development

Development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

Diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in

Independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.
PSO2	Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1. To understand the about smart technologies

2. To know the applications of IoT and the key features of IoT

3. To know the uses of EDM and about the pre stressed concrete their principals

Course Outcomes:

1. Determines the methods in earth retaining structures including in that advanced earth retaining structures
2. To understand about earth quake resistant structures
3. To know about pre fabricated bulding technology and te causes of sesismic waves ,basic terminology.
4. To understand the types of map projections and uses and applications of GIS in civil engineering

5. To know the methods of (1).pre stressting (2). Pretensioning (3). Post tensioning
6. To understand the concept of solar energy utilization in buildings .

UNIT-I

Knows the Smart Technologies

1.1 Understand the overview of Internet of Things(IoT)

1.1.1 Define the term IoT

1.1.2 State the working principle of IoT.

1.1.3 List the key features of IoT

1.1.4 List the components of IoT (hardware, software, technology and protocols)

1.1.5 List the advantages and disadvantages of IoT

1.2 Understand the applications of IoTin various fields of engineering

1.2.1 Mention the application of IoT in Smart Cities

1.2.2 State the application of IoT in Smart Energy and the Smart Grid

1.2.3 Mention the application of IoT in Smart Transportation and Mobility

1.2.4 State the application of IoT in Smart Home, Smart Buildings and Infrastructure

1.2.5 Mention the application of IoT in Smart Factory and Smart Manufacturing

1.2.6 Mention the application of IoT in Smart Health

1.2.7 Mention the application of IoT in Food and Water Tracking and Security

1.2.8 Mention the application of IoT in Social Networks

UNIT-II

Understand the principles and uses of Electronic Surveying instruments

2.1 List the modern surveying instruments

2.2 Explain the principle and uses of EDM

2.3 Explain the features of electronic theodolite and distomat

2.4 State the uses of electronic theodolite and distomat

2.5 Define GPS

2.6 Explain the working principle of GPS

2.7 Explain the segments of GPS

2.8 Enumerate the types of GPS receivers

2.9 Explain the method of taking coordinates of various points using GPS

2.10 List the applications of GPS in civil Engineering

2.11 List merits and demerits of GPS

2.12 Define GIS

2.13 State the components of GIS

2.14 List the types of data used in GIS

2.15 Explain the data used in GIS

2.16 Define map

2.17 List the types of map projections

2.18 List the uses and applications of GIS in civil Engineering

UNIT-III

Understand the Pre stressed concrete

3.1 Understand fundamental principles of prestressed concrete, systems and types of Prestressing,merits and demerits

3.2 State the materials and permissible stresses

3.3 List the losses of prestress

3.4 Explain the methods of 1. Pre stressing and 2. Pretensioning system 3.Post-

tensioning systems

UNIT-IV

Advanced methods in Earth retaining structures

4.1 Understand the concepts of advanced earth retaining structures

4.2 list the advantages of advanced earth retaining structures

4.3 List and explain the methods of advanced earth retaining structures – reinforced anchored earth wall – geogrids – geomats

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UNIT-V

Pre fabricated building technology

5.1 State alternatives for cast in-situ structures

5.2 Understand pre fabrication technology

5.3 State Importance for standardisation and modularisation

5.4 State the pre fabricated structures – explain their utility

5.5 State advantages of the pre fabricated structures

5.6 State Materials used in pre fabricated elements and explain their suitability for various climatic conditions

5.7 Explain types of pre fabricated systems – large panel systems - frame systems – slab / column systems with walls – mixed systems

UNIT-VI

Understand Earth quake resistant structures

6.1 List causes of seismic waves, basic terminology

6.2 Explain 1. Magnitude, 2. Intensity and 3. Energy release

6.3 Characteristics of earthquake

6.4 Understand basic terminology of Earthquake

6.5 Explain seismic zoning

6.6 Explain seismic resistant construction with brick/stone masonry buildings as per IScode provisions

6.7 Understand seismic resistant construction and detailing of R.C. buildings as per code provisions

UNIT-VII

Understand the concept of solar energy utilization in buildings

7.1 Explain the active and passive concepts in heating and cooling

7.2 List the various solar energy utilities like solar water heaters, solar air heaters, solar cookers , lighting and water pump sets and solar PV panels

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Program Name:DIPLOMA
Faculty Name:P.P.MUNINDRA

Class	Semester	Name of The Subject	Subject Code	W.E.F
III DCE	V SEMESTER	CIVIL ENGINEERING DRAWING-III	C-506	14-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
60 Hours	Theory 04	Practical	3	Internal 40	External 60	

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

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Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.
PSO2	Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1.To provide knowledge regarding various types of culverts and bridges and their various sectional views.

2.To provide knowledge regarding public health engineering drawings and Irrigation engineering drawings.

Course Outcomes:

1. Student should be able to draw the plan and various sectional views of various culverts.
2. Student should be able to draw the plan and various sectional views of various bridges.
3. Student should be able to prepare the Public health engineering drawings.
4. Student should be able to prepare the Irrigation engineering drawings.

UNIT- I **Simple Culvert.**

Draw the plan, cross-sectional elevation and longitudinal sectional elevation of

1.1 Pipe culvert (Single Pipe)

1.2. R.C.C slab culvert with square returns.

1.3. R.C.C slab culvert with splayed wings

UNIT- II **Bridges.**

2.1 Two-Span R.C.C T-beam bridge with square return walls.

2.2 Two-Span R.C.C T-beam bridge with splayed wing walls and Returns walls.

UNIT- III **Public health engineering drawings.**

3.1 Sanitory block of a large building showing internal water supply and sanitary fittings and plumbing fixtures (Plan & Section across each unit)

3.2 Water supply and Sanitary connections to a residential building.

3.3 Septic tank with details of connection to a dispersion trench/soak pit

3.4 R.C.C overhead square tank.(four columns with accessories).

UNIT- IV **Irrigation engineering drawings**

4.1 Earthen bunds –

Homogeneous b) Non Homogeneous (Zoned embankment)

4.2 Tank surplus weir with splayed wing walls.

4.3 Canal drop (notch type)

4.4 Tank sluice with tower head.

4.5 Canal regulator

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Program Name: DIPLOMA Faculty Name: S.NAGALAKSHMI

Class	Semester	Name of the Subject	Subject Code	W.E.F
II DCE	V	CAD-II LAB	C-507	14/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory	Practical 6	3	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

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Programme Specific Outcomes:

PSO 1: Applying concepts and solving problems in the branches of civil engineering such as structural, Environmental, Hydraulics, Construction Management and Geo technical Engineering

PSO 2:Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of civil engineering.

Course Objectives:

1. Draws different views of culverts and bridges

2 . Draws the Components of Public health engineering works and irrigation works

Course Outcomes:

CO1 : Analysis and design of civil structures using software

CO2: Carryout analysis and design of culvers and public works

CO3 : Design irrigation drawings and analysis by using auto cad

COURSE CONTENT

1.0 Preparation of Plan,cross sectional elevation and longitudinal sectional elevation of

- 1.1 Pipe Culvert (Single Pipe)
- 1.2 R.C.C. slab culvert with square returns
- 1.3 Two-span R.C.C. T-beam bridge with square walls.

2.0 Preparation of Layouts of water supply & Sanitary lines in buildings

2.1 Sanitary block of a large building showing internal water supply and sanitary fittings and plumbing fixtures (Plan & Section across each unit)

2.2 Water supply & sanitary connections to a residential building

2.3 Septic tank with details of connection to a residential building.

2.4 R.C.C overhead square tank(four columns with accessories).

3.0 Preparation of Plan,cross sectional elevation and longitudinal sectional elevation

Of

3.1 Earthen bunds –

a) Homogeneous b) Non Homogeneous (Zoned embankment)

3.2 Tank surplus weir with splayed wing walls

3.3 Canal drop (notch type)

3.4 Tank sluice with tower head.

3.5 Canal regulator.

4.0 Computer application by using MS Word & MS Excel

4.1 Test report of the building materials using MS-Word.

4.2 Complete estimation of a residential building using MS-Excel involving linkage of cells in different sheets viz., Lead statement, Data sheet, detailed . estimation and Abstract estimation

5.0 Study of Packages available for Analysis, Design, Drafting and Estimation.

5.1 Analysis – Staad pro, SCADS, Ansys, GT Studl, E-Tab, ASAP.

5.2 Design – Staad pro, STRUDS etc.,

5.3 Drafting – Auto CAD, Intelli CAD, Architectural CAD etc.,

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Program Name: DIPLOMA Faculty Name:G.SIRISHA

Class	Semester	Name of the Subject	Subject Code	W.E.F
III DCE	V	LIFE SKILLS	C-508	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
45 Hours	Theory	Practical 3	3	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

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10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Civil Engineering Diploma Students acquire structural and managerial skill that make them an employable graduate.

PSO 2: The Civil Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1. Understand concept of goal setting and time management skills.

2. Understand problem solving skills and leadership skills.

Course Outcomes:

CO1 : Understand the abilities time management self steam.

CO2: Understand and improve the teamwork spirit and stress management for practicing speaking.

Content

1.0 Understand the concept of Attitude
1.1 Define ‗Attitude'
1.2 Explain the importance of Attitude
1.3 Distinguish between Positive and Negative Attitudes
1.4 Life Response: Need for change of Attitude
1.5 Positive Attitude: Key to success in Personal and Professional Lives
2.0 Understand the concept of Adaptability
2.1 Define the term ‗Adaptability'
2.2 Explain the concept of Adaptability
2.3 Advantages of Adaptability
2.4 Disadvantages of Lack of Adaptability
2.5 Need for positive response to change
3.0 Understand the concept of Goal setting
3.1 Define the terms‗Goal' and ‗Goal Setting'
3.2 Explain the significance of Goal setting&Long and Short term goals
3.3 Explain the following concepts
a) Wish b) Dream c) Goal
3.4 Explain the reasons for and consequences of not setting goals
3.5 The SMART features in Goal setting
4.0 Understand the concept of Motivation
4.1 Define ‗Motivation' ; Inspiration Vs Motivation
4.2 Importance of motivation in Goal setting
4.3 Distinguish between Internal (Self) Motivation and External Motivation
4.4 De-motivating Factors and how to overcome them
4.5 Motivating oneself and others
5.0 Understand Time Management skills
5.1 Define ‗Time Management'.
5.2 Comprehend the significance of Time Management.
5.3 Explain the Time Quadrant
5.4 Common Time wasters and how to overcome them.
5.5 How to meet deadlines and targets within time
6.0 Understand Critical Thinking
6.1 Define―Critical Thinking‖,
6.2 Understand the importance of Critical Thinking
6.3 Distinguish between facts and opinions (assumptions)

6.4 Inculcating different perspectives
6.5 Developing Reasoning abilities and form sound judgments

7.0 Understand Creativity

7.1 Understand the importance of and need for creative ideas
7.2 Distinguish between Linear Thinking and Lateral Thinking
7.3 Distinctive qualities of creative people
7.4 Unusual or creative use of familiar objects
7.5 Creative ways of solving problems

8.0 Understand Problem Solving

8.1. Define the concept of Problem solving
8.2 Viewing the problems as challenges
8.3 Different steps in solving a problem
8.4 Selecting the best solution to solve a problem
8.5 Lateral thinking in Problem solving

9.0 Understand Team Work

9.1 Define Team work
9.2 Develop Team skills
9.3 Advantages of team work
9.4 Understand responsibilities as a team player
9.5 Problems of working in a team and possible solutions

10.0 Understand Leadership

10.1 Define Leadership
10.2 Identify Leadership qualities
10.3 Analyze one‘s strengths and limitations as a leader
10.4 Types of Leadership: Autocratic and Democratic
10.5 Leadership by example

11.0 Understand Stress Management

11.1 Define Stress
11.2 Explain the causes of stress
11.3 Learn Stress Management skills
11.4 Need for positive thinking and self esteem
11.5 Practice Stress Management skills

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Program Name:DIPLOMA

Faculty Name:SK. SHAJAHAN

Class	Semester	Name of The Subject	Subject Code	W.E.F
III DCE	VI SEM	CIVIL ENGINEERING WORKSHOP	C-509	14-11-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
45 Hours	Theory	Practical 03	3	Internal 40	External 60	

Programme Outcomes:

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Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.
PSO2	Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1.To give knowledge regarding carpentry skills and barbending skills.

2.To give knowledge regarding plumbing, electrical installation .

Course Outcomes:

1. Student should perform carpentry in the field and able to prepare barbending schedule for different bars.
2. Student should perform plumbing and its operations in the field.
3. Student should know &perform different electrical installations.

LIST OF EXPERIMENTS:

1. **Carpentry**

0 Tools used in carpentry
1 Erection of Scaffolding Material
2 Position of Shuttering
3 Fixing of form work.

2. **Bar Bending of steel reinforcement**

Preparation of bar bending schedule

Bar bending according to given bar bending schedule
Method of bar bending for Earthquake resistant structures
Field visit to automated bar bending

3. **Plumbing exercises**

0 Thread cutting on GI/PVC pipes
1 Assembling of pipe lines for toilet with two taps, shower and wash basin
2 Fixing of floor traps, gully traps, water closet, drain pipes
3 Laying stoneware/PVC pipes and construction of inspection chambers

4. **Electrical Exercises**

i.Identity various electrical accessories

ii.Identify line, neutral and earth terminals in power sockets and power plugs
iii.Measure the AC voltage between line and neutral using DMM iv.Study of earthing and earth pit

v.Study of different wiring systems

0 Open conduit system
1 Concealed conduit system

1 Measurement of the following using DMM

0 AC Voltage
1 DC Voltage (Battery)
2 AC Current (Through a lamp/heater)
3 Check continuity
4 Resistance

2 Connecting a fuse in the main circuit
3 Controlling the lamp using a switch
4 Controlling the fan with a switch and regulator
5 Connect a i) 2-pin socket ii) 2-pin socket with switch control
6 Control one lamp with 2 switches (Staircase wiring)
7 Study of inverter/UPS wiring
8 Electrical estimation and costing

9 Study of 3-phase system

5. Demonstration of modern surveying instruments like Electronic theodelite, EDM and the concept of GIS, GPS

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Program Name: **DIPLOMA** **Faculty Name:** **S.G.S.PRIYANKA**

Class	Semester	Name of the training	Duration	W.E.F
III	VI	INDUSTRIAL TRAINING	6months	12/6/18

RULES AND REGULATIONS:

1. A candidate shall be assessed twice in the spell of industrial training i.e. at the end of third month and finally before he/she completes the industrial training
2. A candidate shall be assessed twice during the mid spell of industrial training and at the end of industrial training.
3. The assessment shall be carried out by a committee comprising of
(a) A representative of the Industry where the candidate is undergoing training
(b) A staff member of the concerned section of the polytechnic.
4. Each assessment should be as per the Assessment scheme listed

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1:	Applying concepts and solving problems in the branches of Civil Engineering such as Structural, Environmental, Hydraulics, Construction Management and Geotechnical Engineering.
PSO2:	Enabling students to understand their role as leaders and attitude process and to be effective in professional practice of Civil Engineering.

Course Objectives:

1. Students able to expose to the core and working environment in order to improve their practical skills.
2. To develop communication and managerial skills by themselves to the modern world.

Course Outcomes:

Upon completion of practical training in an industry, the student will be able to
1. The organizational set up from top executive to workmen level
2. Know the aspects to be considered during preliminary projects in respect of Irrigation/Road/Rural water supply/Housing colony etc.,
3 Know the duties of different officers in the organization
4. Know about administrative sanction and technical sanction
5. Know various stages of construction
6. Knows inspection of form work, reinforcement grills etc.,
7. Know the methods of procurement of labour, material and equipment
8. Know tenders, contract and contract systems
9. Know the need & principles supervision of works
10. Know measurement book and muster roll
11 . Know the preparation, checking and payment of bills
12 . Know the requirements of a licensed surveyor/contractor/manufacturer of building material(s).

ASSESSMENT SCHEME

S. No.	Name of the Parameter	Max. Marks Allotted for each Parameter
1.	Attendance and punctuality	10
2.	General conduct during the period	10
3.	Ability to communicate & human relations	10
4.	Familiarity with materials, tools & machinery	10
5.	Attitude towards job	10
6.	Manual skills	10
7.	Comprehension & Observation	10
8.	Supervising ability	10
9.	Safety and Environmental consciousness	10
10.	Maintenance of dairy	10
	Total:	**100**

1. The remaining 100 marks are to be allotted as follows: For maintenance of log book 30 marks

For the training report 30 marks,

For seminar / viva-voce 40 marks.

The assessment at the institute level (seminar / viva-voce) is to be done by the following three members individually and be averaged.

(1) Head of Section.
(2) External Examiner preferably from Industry
(3) Staff member who assessed the student during the Industrial Training.

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PRINCIPAL
POLYTECHNIC
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology,
Kothapet, VIJAYAWADA-520 001

Program Name: DIPLOMA Faculty Name:G.SIRISHA

Class	Semester	Name of the Subject	Subject Code	W.E.F
I DME	I	ENGLISH	M-101	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory 3	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1. Understand the basic fundamentals of language abilities.

2. To learn the listening, speaking, reading and writing for learning technical subjects..

Course Outcomes:

CO1 : Understand the abilities of communication.

CO2: Understand and improve the opportunity for practicing speaking .

CO3 : Understand the read and comprehend the details.

CO4 : Develop the various forms of written communication.

CO5: Understand the writing composition and data interpretation.

CO6: Understand the spoken communication suited to various situtation.

COURSE CONTENT

1.0 Extend their vocabulary in the direction of their future needs

1.1 Locate words, learn spellings, understand meanings

1.2 Pronounce words intelligibly

1.3 Find synonyms and antonyms

1.4 Use affixation

1.5 Comprehend meanings of words by understanding meanings of roots

2.0 Learn various grammatical structures

2.1 Identify and use nouns

2.2 Identify and use pronouns

2.3 Use the present tense

2.4 Use the past tense

2.5 Use the future tense

2.6 Identify and use adjectives

2.7 Identify and use adverbs

2.8 Use prepositions

2.9 Use linkers

2.10 State basic sentence structures

2.11 Construct different types of sentences

2.12 Frame questions to elicit information

2.13 Frame questions for confirmation

2.14 Use active voice

2.15 Use passive voice

2.16 Use direct speech

2.17 Use indirect speech

2.18 Identify and correct errors

3.0 Read and comprehend English

3.1 Identify the main ideas

3.2 Identify the specific details

3.3 Draw inferences

3.4 Give contextual meanings of the words

3.5 Perceive tone in a text

4.0 Learn to excel in various forms of written communication (writing composition and data interpretation)

4.1 Identify components of a good paragraph

4.2 Write types of paragraphs

4.3 Distinguish between formal and informal letters

4.4 Write personal letters

4.5 Write leave letters

4.6 Write official letters

4.7 Write letters of complaints

4.8 Prepare a resume

4.9 Write a cover letter

4.10 Write short messages

4.11 Report incidents

4.12 Report experiments

4.13 Report Industrial visits

4.14 Write work done statements

4.15 Write maintenance reports

4.16 Make notes using Cue method and Mapping method

4.17 Summarize Paragraphs

4.18 Present and Interpret Data from flow charts, tree diagrams, bar graphs, tables, pie charts

Practice spoken communication suited to various situations.

4.19 Use appropriate expressions to greet and take leave

4.20 Use proper expressions to make requests

4.21 Use apt expressions for asking and giving directions

4.22 Use suitable expressions to seek and offer suggestions

4.23 Use suitable expressions to state intentions

4.24 Use suitable expressions to state feelings

4.25 Use appropriate expressions to state agreement and disagreement

4.26 Use proper expressions to make complaints

4.27 Use suitable expressions to express obligations

Course Material

The textbook prepared by the faculty of English of Polytechnics in AP.

Reference Books

1. Essential English Grammar (Intermediate Level) Raymond Murphy

2. Learn English (A Fun Book of Functional Language, Santanu Sinha Chaudhuri

Grammar and Vocabulary)

3. Grammar Builder (Entire Series) Oxford University Press

4. High School English Grammar (Revised Edition) Wren and Martin

5. Sentence skills with Readings John Langan, Paul Langan

(fourth Edition, Tata McGraw Hill)

6. Word Power Made Easy Norman Lewis

7. Spoken English Shashi Kumar and Dhamija

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College of Engineering & Technology,
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Program Name: DIPLOMA   Faculty Name: E.SUNDESH BABU

Class	Semester	Name of the Subject	Subject Code	W.E.F
I DME	I	Engineering Mathematics	M-102	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
150 Hours	Theory 5	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Mechanical Engineering such as Basic knowledge of Calculus.
PSO2	Enabling students to understand the concept of Trigonometry & Algebra and it's applications and to be effective in professional practice of Mechanical Engineering.

Course Objectives:

1. The students completing this course are expected to understand the concepts of Algebra and Trigonometry.

2.They are required to understand the concepts of Differential Calculus & Application of Differentiation.

Course Outcomes:

CO1:Basic knowledge of Use Matrices & Logarithms for solving engineering problems

CO2:Using the basic knowledge of In descent Mathematics.

CO3:Using Concepts of differential Calculus.

CO4:Using properties of Conics in engineering applications.

CO5:Applying Real life applications.

COURSE CONTENT

1. Algebra

a) Use Logarithms in engineering calculations.Define logarithm and list its properties.Distinguish natural logarithms and common logarithms.Explain the meaning of e and exponential function.State logarithm as a function and its graphical representation.Use the logarithms in engineering calculations.Resolve Rational Fraction into sum of Partial Fractions in engineering problems.Define the fractions of polynomials
Explain the procedure of resolving rational fractions of the type mentioned below into partial fractions
Use Matrices for solving engineering problems.Define a matrix and order of a matrix.State various types of matrices with examples (upto 3rd order square matrices).Define the transpose of a matrix and write its properties. Define symmetric and skew-symmetric matrices.
b) Resolve a square matrix into a sum of symmetric and skew- symmetric matrices with examples in all cases. Define minor, co-factor of an element of 2X2 and 3x3 square matrices with examples.Define multiplicative inverse of a matrix and list properties of adjoint and inverse. Compute adjoint and ultiplicative inverse of a square matrix.Representation of system of linear equations (2 variables in 2 equations and 3 variables in 3 equations) in matrix form. Solve system of linear equations using Cramer's rule.Solve system of linear equations by matrix inversion method, State elementary row operations.Solve a system of linear equations by Gauss- Jordan method.

2. Trigonometry

a) Define trigonometric ratios of any angle. List the values of trigonometric ratios at specified values.Draw graphs of trigonometric functions. Explain periodicity of trigonometric functions.Define compound angles and state the formulae of sin(A±B), cos(A±B), tan(A±B) and cot(A±B).Give simple examples on compound angles to derive the values of $\sin 15^0$, $\cos 15^0$,$\sin 75^0$, $\cos 75^0$, $\tan 15^0$, $\tan 75^0$ etc.Derive identities like sin (A+B) sin(A-B) = $\sin^2 A - \sin^2 B$ etc., Solve simple problems on compound angles.Derive the formulae of multiple angles 2A, 3A etc and sub multiple angles A/2 in terms of angle A of trigonometric functions.Derive useful allied formulas like sinA= (1- cos2A)/2 etc.,Derive the formulae on transforming sum or difference of two trigonometric ratios in to a product and vice versa- examples on these formulae.Explain the concept of the inverse of a trigonometric function by selecting an appropriate domain and range. Define inverses of six trigonometric functions along with their domains and ranges.Derive relations between inverse trigonometric functions so that given A= $\sin^{-1}x$, express angle A in terms of other inverse trigonometric functions - with examples. State various properties of inverse trigonometric functions and identities like $\sin^{-1}x+\cos^{-1}x = \pi/2$ etc.

b) Explain what is meant by solutions of trigonometric equations and find the general solutions of sin x=k, cos x =k and tan x=k with appropriate examples. Solve models of the type a $\sin^2 x$ + b sin x +c=0, a cos x + b sin x=c etc., and problems using simple transformations.State sine rule, cosine rule, tangent rule and projection rule. Explain the formulae for sin A/2, cos A/2, tan A/2 and cot A/2 in terms of semi perimeter and sides a, b, c .List various formulae for the area of a triangle. Solve problems using the above formulae. Solve a triangle when (i) three sides, (ii) two sides and an included angle, (iii) two sides and an opposite angle-case of two solutions and (iv) one side and two angles are given.Define Sinh x, cosh x and tanh x and list the hyperbolic identities Represent inverse hyperbolic functions in terms of logarithms.

Define complex number, its modulus , conjugate and list their properties. Define the operations on complex numbers with examples.Define amplitude of a complex number. Represent the complex number in various forms like modulus-amplitude (polar) form, Exponential (Euler) form – illustrate with examples.State DeMoivre's theorem and its applications to complex numbers e.g., finding the roots, powers, simplifications of a complex number with illustrative examples.

3. Co-ordinate Geometry

a) Write the different forms of a straight line – point slope form, two point form, intercept form, normal form and general form.Solve simple problems on the above forms Find distance of a point from a line, acute angle between two lines, intersection of two non-parallel lines and distance between two parallel lines.Define locus of a point – circle and its equation.

b) Find the equation of a circle given (i) Center and radius (ii) Two ends of a diameter (iii) Centre and a point on the circumference (iv) Three non collinear points.Write the general equation of a circle and find the centre and radius.Define a conic section. Explain the terms focus, directrix, eccentricity, axes and latus rectum of a conic with illustrations.Find the equation of a conic when focus, directrix and eccentricity are given Describe the properties of Parabola, Ellipse and Hyperbola in standard form.

4. Differential Calculus

a) Mention the Standard limits.Solve the problems using the above standard limits Evaluate the limits of the type.Explain the concept of continuity of a function at a point and on an interval with some examples whether a given function is continuous or not.State the concept of derivative of a function y = f(x) – definition, first principle.State the significance of derivative in scientific and engineering applications. Find the derivatives of elementary functions like xn , ax, ex, log x, sin x, cos x, tanx, Secx, Cosecx and Cot x using the first principles.Find the derivatives of simple functions from the first principle. State the rules of differentiation of sum, difference, scalar multiplication, product and quotient of functions with illustrative and simple examples.Explain the method of differentiation of a function of a function (Chain rule) with illustrative examples.

b) Find the derivatives of Inverse Trigonometric functions and examples using the Trigonometric transformations.Explain the method of differentiation of a function with respect to another function and also differentiation of parametric functions with examples. Find the derivatives of hyperbolic functions.Explain the procedures for finding the derivatives of implicit function with examples. Explain the need of taking logarithms for differentiating some functions with examples like $[f(x)]^{g(x)}$.Explain the concept of finding the higher order derivatives of second and third order with examples. Explain the concept of functions of several variables, partial derivatives and difference between the ordinary and partial derivatives with simple examples.Explain the definition of Homogeneous function of degree n Explain Euler's theorem for homogeneous functions with applications to simple problems.

5. Applications of Differentiation

a) State the geometrical meaning of the derivative as the slope of the tangent to the curve y=f(x) at any point on the curve.Explain the concept of derivative to find the slope of tangent and to find the equation of tangent and normal to the curve y=f(x) at any point on it.Find the lengths of tangent, normal, sub-tangent and sub normal at any point on the curve y=f(x).Explain the concept of angle between two curves and procedure for finding the angle between two given curves with illustrative examples.Explain the derivative as a rate of change in distance-time relations to find the velocity and acceleration of a moving particle with examples.Explain the derivative as a rate measure in the problems where the quantities like volumes, areas vary with respect to time- illustrative examples.

b) Define the concept of increasing and decreasing functions.Explain the conditions to find points where the given function is increasing or decreasing with illustrative examples.Explain the procedure to find the extreme values (maxima or minima) of a function of single variable - simple problems yielding maxima and minima.Solve problems on maxima and minima in applications like finding areas, volumes, etc.Find the absolute error, approximate error, relative error and percentage error in functions of single variable.

REFERENCE BOOKS

1. A text book of matrices by Shanti Narayan,
2. Plane Trigonometry, by S.L. Loney
3. Co-ordinate Geometry. by S.L. Loney
4. Thomas Calculus. Pearson Addison-Wesley publishers
5. Calculus - I, by Shanti Narayan and Manicavachgam Pillai, S.V Publications

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Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology,
Kothapet, VIJAYAWADA-520 001

Program Name: DIPLOMA   Faculty Name: T.LAKSHMI DEVI

Class	Semester	Name of the Subject	Subject Code	W.E.F
I DME	Year end	Engineering Physics	M-103	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
120 Hours	Theory 4	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Mechanical Engineering such as Basic knowledge of Calculus.
PSO2	Enabling students to understand the concept of Trigonometry & Algebra and it's applications and to be effective in professional practice of Mechanical Engineering.

Course Objectives:

1. The students completing this course are expected to understand the concepts of Engineering physics and its applications.

2. The student will able to work n any field with the basic knowledge of physics.

Course Outcomes:

1. Understanding the concepts of units and dimensions and vectors.
2. Understanding the concepts of kinematics and friction.
3. Understanding the concepts of work, power energy& SHM.
4. Understanding the concepts Heat & Laws of thermodynamics.
5. Understanding the concepts of Properties of Matter, Electricity and Magnetism.
6. Understanding the concepts of Modern physics.

COURSE CONTENT

1. Units and Dimensions:
Introduction – Physical quantity – Fundamental and Derived quantities – Fundamental and Derived units- SI units –Multiples and Sub multiples – Rules for writing S.I. units-Advantages of SI units – Dimensions and Dimensional formulae- Dimensional constants and Dimensionless quantities- Principle of Homogeneity- Advantages and limitations of Dimensional analysis- - Problems.

2. Elements of Vectors:
Scalars and Vectors –Types of vectors(Proper Vector, Null Vector, Unit Vector, Equal , Negative Vector, Like Vectors, Co-Initial Vectors, Co-planar Vectors and Position Vector).Addition of vectors- Representation of vectors- Resolution of vectors - Parallelogram, Triangle and Polygon laws of vectors–Subtraction of vectors- Dot and Cross products of vectors-Problems

3. Kinematics
Introduction- Concept of acceleration due to gravity- Equations of motion for a freely falling body and for a body thrown up vertically- Projectiles- Horizontal and Oblique projections- Expressions for maximum height, time of flight, range - problems

4. Friction:
Introduction to friction- Causes- Types of friction- Laws of friction- Angle of repose-Angle of friction— Motion of a body over a horizontal surface- smooth inclined plane- rough inclined plane- Advantages and disadvantages of friction- Methods of reducing friction – Problems

5. Work, Power and Energy:
Work, Power and Energy- Definitions and explanation- potential energy- kinetic energy- Derivations of Potential and Kinetic energies-K.E and Momentum relation - Work-Energy theorem- Law of Conservation of energy- Problems

6. Simple Harmonic Motion:
Introduction- Conditions of SHM- Definition- Examples- Expressions for displacement, velocity, acceleration, Time period, frequency and phase in SHM- Time period of a simple pendulum- Laws of simple pendulum-seconds pendulum- Problems

7. Heat and Thermodynamics:
Expansion of Gases- Boyle's law- Absolute scale of temperature- Charles laws- Ideal gas equation- Universal gas constant- Differences between r and R- Isothermal and adiabatic

processes- Laws of thermodynamics- Specific heats - molar specific heats of a gas –Derivation of Mayer‘s Equation- Problems

8. Sound:

Sound- Nature of sound- Types of wave motion -musical sound and noise- Noise pollution – Causes & effects- Methods of reducing noise pollution- Beats- Doppler effect- Echo-Reverberation-Reverberation time-Sabine _s formula-Conditions of good auditorium-Problems

9. **Properties of matter**

Definition of Elasticity –Definition of stress and strain -the uni t s and dimens ional formulae for s t res s and s t rain -The Hooke‘s law- Definition of surface tension-Explanation of Surface tension with reference to molecular theory - Definition of angle of contact - Definition of capillarity -The formula for surface tension based on capillarity - Explanation of concept of Viscosity - Examples for surface tension and Viscosity - Newton‘s formula for viscous force-Definition of co-efficient of viscosity- The effect of temperature on viscosity of liquids and gases - Poiseuille‘s equation for Co-efficient of viscosity- Th e r e la t e d n ume r i c a l problems

10. Electricity & Magnetism:

Ohm‘s law and explanation- Specific resistance- Kirchoff ‘s laws- Wheatstone‘s bridge - Meter bridge- Coulomb‘s inverse square law magnetic field- magnetic lines of force-Magnetic induction field strength- magnetic induction field strength at a point on the axial line - magnetic induction field strength at a point on the equatorial line –problems.

11. Modern Physics;

Photoelectric effect –Einstein‘s photoelectric equation-laws of photoelectric effect - photoelectric cell –Applications of photo electric effect- Total internal reflection- fiber optics- -principle and working of an optical fiber-types of optical fibers - Applications of optical fiberssuperconductivity - applications

REFERENCE BOOKS

1. Intermediate physics Volume-I & 2 Telugu Academy (English version)
2. Unified physics Volume 1,2,3 and 4 Dr.S.L Guptha and Sanjeev Guptha
3. Text book of physics Volume I Resnick & Holiday
4. Text book of applied physics Dhanpath Roy
5. Fibre optics D.A Hill
6. NCERT Text Books XI & XII Standard.

Signature of faculty. **Signature of Principal**

T.lakshmi Devi

Program Name: DIPLOMA Faculty Name:B. ANIL KUMAR

Class	Year	Title of The Paper	Paper Code	W.E.F
I DME	I	ENGINEERING CHEMISTRY AND ENVIRONMENTAL SUTDIES	M 104	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks		Credits
120 Hours	Theory 4	Practical	3	Internal 20	External 80	

Programme Outcomes:

	Program Outcome
PO1.	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
Selected as application of knowledge of mathematics and science is involved in calculating troubles using advanced materials as engineering materials.	
PO2.	**Problem analysis**: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Selected as students can identify and analyze the problems of corrosion and can adopt new methods to overcome corrosion	
PO3.	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
Selected as the student can develop and construct the fuel cells and batteries.	

PO4.	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
Selected as students are required to do experiments using electronic devices like conductometers, potentiometers.	
PO5.	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
selected as students learn the usage of modern tools and techniques for complex engineering materials like nanomaterials , liquid crystals, polymers.	
PO6.	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
selected as ,by the contextual knowledge of green chemistry, fuels etc student can assess societal, health and safety issues	
PO7.	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
Selected as the course address issues related to environment and sustainability.	
PO8.	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
selected as the course address ethical issues related to minimizing the usage of hazardous chemicals and promotes green chemistry.	
PO9.	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
Not selected as the course does not related.	
PO10.	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
Not Selected as the course does not address complex engineering activities with the engineering community.	
PO11.	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
Selected as students can understand how to manage projects in multidisciplinary environment	
PO12.	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of

	technological change.
selected as student can recognize the need for life-long learning in the context of technological change.	
PSO 1	Knowledge of contemporary issues in the civil engineering industry to solve societal issues
Selected as the course addresses, advanced materials to solve societal issues	
PSO 2	To qualify in competitive examinations for higher education and employment
selected as the course addresses, basics for higher education and employment**.**	

Course Objectives:

- Plastics are nowadays used in household appliances; also they are used as composites (FRP) in aerospace and automotive industries.
- Fuels as a source of energy are a basic need of any industry, particularly industries like thermal power stations, steel industry, fertilizer industry etc., and hence they are introduced.
- The basics for the construction of galvanic cells are introduced. Also if corrosion is to be controlled, one has to understand the mechanism of corrosion which itself is explained by electrochemical theory.
- With the increase in demand, a wide variety of materials are coming up; some of them have excellent engineering properties and a few of these materials are introduced.
- Water is a basic material in almost all the industries, more so where steam is generated and also where it is supplied for drinking purposes.
- Materials used in major industries like steel industry, metallurgical industries and construction industries and electrical equipment manufacturing industries are introduced. Also lubrication is introduced

Course Outcomes:

	Course Outcome	POs/ PSOs	CL (Cognitive level)	Class Sessions taken
CO1	**Develop the** knowledge of basic construction materials with its vital role by evaluating utility of polymers in chemical and hardware industries.	PO1, PO2, PO3, PO4, PO5, PO8,PO11, PO12,PSO 1,PSO2	EV	20
CO2	Devolop the basic knowledge regarding metals,Extrapolate the application of fuels in day to day life and to understand energy – related problems and solve them,	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8,PO11, PO12 PSO1,PSO 2	AP	18
CO3	Extrapolate the knowledge of galvanic cell, reference electrode and batteries in chemical and other engineering areas. Develop corrosion protection methods by	PO1, PO2, PO4, PO5, PO8,PO11, PO12, PSO1,PSO 2	EV	25

	evaluating different factors influencing corrosion			
CO4	Explore the engineering applications to environment like air pollution, water pollution	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO11, P PO8,O12, PS01,PSO2	AP	23
CO5	Appraise the quality and utility of suitable water for industrial as well as domestic applications.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8,PO11, PO12, PSO1,PSO 2	EV	14
CO6	Explore the engineering applications of various solutions, acids and bases	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO11, PO12, PSO1, PSO2	AP	20
Total Hours of instruction				120

UNIT I: FUNDAMENTALS OF CHEMISTRY

1.1 Explain the charge and mass of fundamental particles of an atom (electron, proton and neutron)

1.2 Explain the concept to f atomic number and mass number.

1.3 State the Postulates of Bohr’s atomic theory and its limitations.

1.4 Explain t he sig nif icance of f our Quantum numbers.

1.5 Explain 1 . Aufbau principle, 2 Pauli’s exclusion principle 3 Hund’s rule.

1.6 Define Orbital in an atom.

1.7 Draw the shapes of s p and d - Orbitals .

1.8 Distinguish between Orbit and Orbital

1.9 Write the electronic configuration of elements up to atomic number 30

1.10 Explain the significance of chemical bonding

1.11 Explain the Postulates of Electronic theory of valency

1.12 Define the types of Chemical bonding viz., Ionic, Covalent bonds.

1.13 Explain the types of Chemical bonding viz., Ionic, Covalent bonds with examples.

1.14 Explain bond formation in NaCl and MgO.

1.15 List Properties of Ionic compounds

1.16 Explain bond formation in Hydrogen molecule, Oxygen molecule, and Nitrogen molecule using Lewis dot method.

1.17 List Properties of Covalent compounds

1.18 Distinguish between properties of ionic compounds and covalent compounds.

1.19 Structures of ionic solids-define a) Unit cell b) co-ordination number.

1.20 Structures of Unit cells of NaCl and CsCl.

1.21 Define the term. Oxidation number.

1.22 Calculate the Oxidation Number of underlined atoms in the following examples

a)$K\underline{Mn}O_4$ b) $K_2\underline{Cr}_2O_7$ c) $H\underline{N}O_3$ d) $H_2\underline{S}O_4$ e) $\underline{Cl}O_4^-$ f) $\underline{N}H_4^+$

1.23 Differentiate between Oxidation Number and Valency

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UNIT II: SOLUTIONS

2.0 Calculate Molarity and Normality of given Solution

2.1 Define the terms 1. Solution, 2. Solute and 3. Solvent

2.2 Classify solutions based on physical state and solubility

2.3 Define mole

2. 4 Problems on ‘Mole concept’

2.5 Define the terms 1. Atomic weight, 2.Molecular weight and 3. Equivalent weight

2.6 Calculate Molecular weight and Equivalent weight of given Acids,(HCl,$H_2SO_4HNO_3$)Bases ($NaOH$, KOH, $Ca(OH)_2$) and Salts ($NaCl$, Na_2CO_3, $CaCO_3$)

2.7 Define 1.Molarity, 2.Normality of solutions

2.8 Solve Numerical problem son Molarity and Normality

a) calculate the Molarity or Normality if weight of solute and volume of solution are given

b) calculate the weight of solute if Molarity or normality with volume of solution are given

c) problems on dilution to convert high concentrated solutions to low concentrated solutions

UNIT III: ACIDS AND BASES

3.0 Understand the concepts of Acids and bases

3.1 Explain Arrhenius theory of Acids and Bases

2 State the limitations of Arrhenius theory of Acids and Bases

3 Explain Bronsted – Lowry theory of acids bases

3.4 State the limitations of Bronsted – Lowry theory of acids bases

5 Explain Lewis theory of acids and bases

3.6 State the limitations of Lewis theory of acids and bases

7 Explain the Ionic product of water

8 Define pH and explain Sorenson's scale

3.9 Solve the Numerical problems on pH(Strong Acids and Bases)

3.10 Define Buffer solution

3.11 Give at least three examples for Buffer solutions

3.12 State the applications of Buffer solution

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3.12 State the applications of Buffer solution

UNIT IV: PRINCIPLES OF METALLURGY

4.0 Understand the Principles of Metallurgy

4.1 List at least eight Characteristics of Metals

4.2 Distinguish between Metals and Non Metals

4.3 Define the terms 1.Mineral, 2.Ore, 3. Gangue, 4.Fluxand 5.Slag

4.4 Describe the methods of concentration of Ore; 1.Handpicking,2.Levigation, and 3. Froth Floatation

4.5 Describe the methods involved in extraction of crude metal- Roasting, Calcination and Smelting.

4.6 Explain the purification of Metals by Electrolytic Refining

4.7 Define an Alloy

4.8 Write the Composition of the following alloys :1.Brass, 2 . Germansilver, 3 Nichrome

4.9 L i s t t h e uses of the following Alloys: 1. Brass, 2.Germansilver, 3.Nichrome

UNIT V: ELECTROCHEMISTRY

5.0 Understand the concepts of Electrochemistry

5.1 Define the terms1. Conductor, 2. Insulator, 3.Electrolyte 4.Non–electrolyte

5.2 Distinguish between metallic conduction and Electrolytic conduction

5.3 Explain electrolysis by taking example fused NaCl

5.4 Explain Faraday's laws of electrolysis

5.5 Define 1 . Chemical equivalent (E) 2 . Electrochemical equivalent (e) and their relation.

5.6 Solve the Numerical problems based on Faraday's laws of electrolysis

5.7 Define Galvanic cell

8 Explain the construction and working of Galvanic cell

9 Distinguish between electrolytic cell and galvanic cell

10 Explain the electrode potentials and standard electrode potentials

11 Explain the electro chemical series and its significance

12 Explain the emf of a cell.

13 Solve the numerical problems on emf of a the cell based on standard electrode potentials.

UNIT VI: CORROSION

Understand the concept of Corrosion

6.1 Define The term corrosion

6.2 state the Factors influencing the rate of corrosion

6.3 Describe the formation of a)composition cell, b)stress cell ,c) concentration cell during corrosion.

6.4 Define rusting of iron and Explain the mechanism of rusting of iron.

6.5 Explain the methods of prevention of corrosion:

a)Protective coatings (anodic and cathodic coaitings)

Cathodic protection(Sacrificial anode process and Impressed–voltage process)

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Cathodic protection(Sacrificial anode process and Impressed–voltage process)

UNIT VII: WATER TECHNOLOGY

7. 0 Understand the concept of Water Technology

7.1 State the various Sources of water like Surface water and sub-surface water.

7.2 Define the terms soft water and hard water with respect to soap consumption.

7.3 Define the term hardness o f w a t e r

7.4 Types of hardness of water 1.Temporary hardness 2.Permanent hardness

7.5 List the salts that causing hardness of water(with Formulae)

7.6 State the disadvantages of using hard water in industries

7.7 Define Degree of hardness, units of hardness(mg/L) or ppm.

7.8 Explain the methods of softening of hard water:a) Ion-Exchange process, b)Permutit process or zeolite process

7.9 Concept of Osmosis and Reverse Osmosis with examples .

7.10 State the applications of Reverse Osmosis.

7.11 State essential qualities of drinking water.

UNIT VIII: POLYMERS

8.0 Understand the concepts of Polymers

8.1 Explain the concept of polymerisation

8.2 Describe the methods of polymerization a) addition polymerization of Ethylene b)condensation polymerization of phenol and formaldehyde(Only flow chart i.e. without chemical equations)

8.3 Define the term plastic

8.4 Classify the plastics with examples

8.5 Distinguish between thermo and thermo setting plastics

8.6 List the Characteristics of plastics

8.7 State the advantages of plastics over traditional materials

8.8 State the disadvantages of using plastics.

8.9 Explain the methods of preparation of the following plastics:

1.Polythene, 2. PVC, 3.Teflon, 4. Polystyrene and 5. Urea formaldehyde

8.10 Explain the uses of the following plastics:

1.Polythene, 2. PVC, 3.Teflon, 4.Polystyrene and 5. Urea formaldehyde

8.11 Define the term natural rubber

8.12 write the structural formula of Natural rubber

8.13 Explain the processing of Natural rubber from latex

8.14 List the Characteristics of natural rubber

8.15 Explain the process of Vulcanization

8.16 List the Characteristics of Vulcanized rubber

8.17 Define the term Elastomer

8.18 Describe the preparation of the following synthetic rubbers a) Buna-s and b)Neo prene rubber

8.19 List the uses of the following synthetic rubbers a) Buna-s and b)Neo prene rubber

UNIT IX: FUELS

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9.0 Understand the concepts of Fuels

9.1 Define the term fuel

9.2 Classify the fuels based on physical state–solid, liquid and gaseous fuels,

9. 3 Classify the fuels based on occurrence-primary and secondary fuels

9.4 List the characteristics of good fuel

9.5 State the composition and uses of gaseous fuels:

a)water gas, b)producer gas, c)natural gas, d)coal gas, e)Biogas and f) acetylene

B.ENVIRONMENTALSTUDIES

1.1 Define the term environment

1.2 Explain the scope and importance of environmental studies

1.3 Segments of environment 1).Lithosphere, 2).Hydrosphere, 3).Atmosphere,

4).Biosphere,

1.4 Define the following terms 1)Pollutant, 2).Pollution, 3).Contaminant, 4)receptor, 5)sink, 6) particulates, 7)dissolved oxygen, 8)Threshold limit value, 9).BOD, and 10).COD 11) eco system .

1.5 State the renewable and non renewable energy sources with examples.

1.6 Define t h e t e r m s :

1) . Producers,   2) . Consumers and 3) . Decomposers with examples.

1.7 Explain bio diversity and threats and biodiversity

1.8 Define air pollution

1.9 Classify the air pollutants-based on origin and physical state of matter.

1.10 Explain the causes of Air pollution.

1.11 Explain the effects of air pollution on human beings, plants and animals.

1.12 State the uses of forest resources.

1.13 State the deforestation and its causes and effects.

1.14 Explain the 1.) Green house effect , 2) Ozone layer depletion and 3) Acidrain.

1.15 Explain the methods of control of Air pollution

1.16 Define Water pollution

1.17 Explain the causes of Water pollution

1.18 Explain the effects of Water pollution on living and Non-living things.

1.19 Explain the methods of control of Water pollution.

CO	PO1 (K3)	PO2 (K4)	PO3 (K6)	PO4 (K6)	PO5 (K6)	PO6 (K6)	PO7 (K1)	PO8 (K3)	PO9 (K3)	PO10 (K2)	PO11 (K5)	PO12 (K2)	PSO1 (K5)	PSO2 (K5)
CO1 K3	2	1	1	1	1	-	-	2	--	-	1	3	1	1
CO2 K5	3	3	1	1	1	1	3	3	--	-	2	3	2	2
CO3 K5	3	3	-	1	1	-	-	3	--	-	2	3	2	2
CO4 K5	3	3	2	2	2	2	3	3	--	-	2	3	2	2
CO5 K5	3	3	2	2	2	2	3	3	--	-	2	3	2	2
CO6 K3	2	2	2	2	2	2	3	2	--	-	1	3	1	1

REFERENCE BOOKS:

Jain & Jain

O.P. Agarwal

G. Santhi

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POLYTECHNIC
Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology,
Kothapet, VIJAYAWADA-520 001

Program Name: DIPLOMA Faculty Name: K.DIVYA SRI

Class	Semester	Name of the Subject	Subject Code	W.E.F
I DME	I	Engineering Mechanics	M-105	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
120 Hours	Theory 4	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

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Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1.The students completing this course are expected to understand the concepts of forces and its resolution in different planes ,resultant of force system, Forces acting on a body, their free body diagrams using graphical methods.

2.They are required to understand the concepts of centre of gravity and moments of inertia and their application, different types of motion, friction and application of work - energy method.

Course Outcomes:

CO1:Determine resultants of different force systems.

CO2:Apply conditions of static equilibrium to plane force systems

CO3: Determine centroid and center of gravity of composite bodies

CO4:Determine Moment of inertia and Mass moment of inertia of composite bodies

CO5: Solve problems in dynamic systems

CO6:Calculate work, energy for different systems.

COURSE CONTENT

1) Statics
The meaning of word mechanics - Application of Mechanics to Engineering - System of Units - Definition and specification of force - System of forces - Resolution of force - Equilibrium and Equilibrant - Statement of Parallelogram law of forces, Triangle law of forces, Polygon law of forces and Lami's theorem - Drawing the free body diagram - Numerical problems related to concurrent coplanar forces - Couple and moment of a couple - Condition for equilibrium of a rigid body subjected to number of coplanar non-concurrent forces - Related Numerical problems

2) Friction
Definition of static friction, dynamic friction and impending friction - Laws of solid and liquid friction - Derivation of limiting angle of friction and angle of repose - Resolution of forces considering friction when a body moves on horizontal plane - Resolution of forces considering friction when a body moves on inclined plane - Numerical examples on the above cases

3) Geometric Properties of Sections
Definition and explanation of the terms centre of gravity, centre of mass and Centroid – Centroid of square, rectangle, triangle, semi-circle and trapezium (formulae only without derivations) - Centre of gravity of composite sections by analytical method (T-Section, L-Section I-section and channel section only) - Moment of Inertia - Definition and explanation - Theorems of Moment of Inertia - i) Parallel axes theorem ii) Perpendicular axes theorem - Moment of Inertia for simple Geometrical Sections, Rectangular, circular and triangular section - Radius of Gyration -Calculation of Moment of Inertia and Radius of Gyration of I–Section, Channel Section, T– Section,L–Section (Equal & unequal lengths), Z–section, Built up Sections (Simple cases only)

4) Dynamics
Definition of Kinematics and Kinetics - Classification of motion - Definition of displacement, velocity and acceleration - Newton's Laws of motion (without derivation) - Solving the problems related to the rectilinear motion of a particle Motion of projectile and solving the numerical problems - D'Alembert's principle - Law of conservation of energy - Work-Energy principle – Law of conservation of momentum - Impulse–momentum equation - Solving problems using the above principles - Rotary motion of particle - laws of rotary motion - Definition of centripetal and centrifugal forces -

differentiation between the two - Simple harmonic motion - Definition of the terms frequency, time period, amplitude and frequency - SHM equation, natural frequency -Simple problems on SHM

5) Simple Machines
Definition of simple machine - uses of simple machine - levers and inclined plane - Fundamental terms like mechanical advantage, velocity ratio and efficiency- Expressions for VR in case of Simple, Differential and 3 systems of pulleys, Worms and Worm wheel, Rack and pinion, Winch crabs, Screw jack - Conditions for reversibility and self locking - Law of Simple Machine - Effort lost in friction - Load Equivalent of Friction - Max M A and Max efficiency – Simple problems

6) Basic Link Mechanism
Definition and explanation of link, kinematic pair, kinematic chain, Mechanism, structure and machine - Quadric cycle chain and its inversions - Slider Crank chain and its inversion

REFERENCE BOOKS:

1. Engineering Mechanics by Singer (B.S.Publications)
2. Engineering Mechanics by Basudeb Bhattacharya (Oxford Publishers)
3. Engineering Mechanics by A Nelson(McGraw Hill)
4. Engineering Mechanics by I.B.Prasad
5.Engineering Mechanics by R.S.Khurmi (S.Chand& Company)
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PRINCIPAL
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Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology,
Kothapet, VIJAYAWADA-520 001

Program Name: DIPLOMA Faculty Name:
K.DIVYA SRI

Class	Semester	Name of the Subject	Subject Code	W.E.F
I DME	I	Engineering Mechanics	M-105	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
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POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY

VIJAYAWADA - 520 001.

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STATE BOARD OF TECHNCIAL EDUCATION AND TRAINING

ANDHRA PRADESH :: VIJAYAWADA

Program Name:DIPLOMA Faculty Name:G.N.VMADHUSUDHANA RAO

Class	Semester	Name of the Subject	Paper Code	W.E.F
I DME	I	WORKSHOP TECHNOLOGY	M-106	18/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
120 Hours	Theory 6	Practical	3	Internal 20	External 80

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Course Objectives:

To impart basic knowledge and understanding about the primary manufacturing processes such as carpentry, fitting , foundry,forging metalforming process and working principle of power saws their relevance in current manufacturing industry.

Course Outcomes:

CO1: Understand the basic carpentry tools
CO2:.understand the working principle of different measuring instruments.
CO3: Understand different types of Bulk forming processes like forging, rolling and extrusion .

CO4: Evaluate casting processes like centrifugal, die and Investment casting

CO5:Explain working principle of power saws.

CO6: Explain various sheet metal forming processes like blanking and piercing, deep drawing, bending, spinning, coining and about processing of plastics.

Course Content:

1) Basic Workshop tools & Operations

a) **Carpentry**
i) **Marking & measuring tools:** Scales- rules- fourfold wooden rule- measuring tape- straightedge- try square- bevel square- combination square- marking knife- marking gauge- mortisegauge- cutting gauge- wing compass – trammel – divider- outside calliper- inside calliperspiritlevel- plum bob

ii) **Saws**: Ripsaw - cross cut saw - Panel saw - Tenon saw - Dovetail saw - Bow saw - copingsaw - compass saw - keyhole saw
iii) **Chisels**: Firmer chisel - Bevelled edge firmer chisel - Parting chisel - Mortise chisel - insideand outside gouges
iv) **Planes:** Jack plane - rough plane - smoothing plane - rebate plane - plough plane - router -spoke shave - metal jack plane - special planes
v) **Boring Tools**: Gimlet - wheel brace -ratchet brace - shell bit -auger - expansive bit - centrebit -countersink bit - drill - reamer
vi) **Striking tools**: Hammers -Warrington hammer -claw hammer –mallet
vii) **Holding tools :** Bench vice - bench stop - bench hold fast - sash cramp – G cramp -hand screw
viii) **Miscellaneous tools:** Rasps and files - scraper - oilstone - glass paper - pincer - screwdriver - cabinet screw driver - ratchetscrew driver - saw set
ix) **Wood working Processes:** Marking - sawing - planning - chiselling - boring - Grooving -Rebating
x) **Carpentry joints:** Halving joint -mortise and tenon joint -bridle joint -butt joint - dowel joint -tongue & groove joint - screw & slot joint - dovetail joint - corner joint
xi) **Wood working machines:** Wood working lathe - wood planer-belt sander- spindle sander -disc sander- grinder

b) **Fitting**
i) **Chisels:**Flat chisel - cross cut chisel - half round chisel - diamond point chisel - side chisel
ii) **Files: F**lat file - hand file - square file - pillar file - round file -triangular file - half round file -knife edge file - needle file
iii) **Scrapers:**Flat - triangular - half round iv) **Saws:** Hacksaw - solid frame& adjustable frame -blades
v) **Drill bits:**Flat drill - straight fluted drill - twist drill - parallel shank& tapered shank types
vi) **Reamers:** Hand reamer - machine reamer - straight and spiral flute types
vii) **Taps & dies:** Hand taps - taper tap - plug tap - bottoming tap –solid dies & split dies
viii) **Hammers:** Ball peen - cross peen - straight peen - soft hammer
ix) **Holding tools:** Bench vice – legvice - hand vice - pin vice - tool maker‘s vice - pipe vice
x) **Marking tools**: Surface plate – vblock -angle plate - try square - scriber - prick punch - centre
punch - number punch - letter punch
xi) **Miscellaneous tools**: Screw drivers - single ended & double endedspanners - boxtypespanners - adjustable spanners - cutting pliers - nose pliers -Allen keys
xii) **Checking and measuring instruments:** Outside &inside callipers - spring callipers - odd legcalliper - transfer calliper - dividers - combination square - universal bevel protractor - sinebar - universal surface gauge - engineer‘s parallels - slip gauges - feeler gauge - angle gauge- radius & template gauge - screw pitch gauge - telescopic gauges - plate & wire gauge - ringand plug gauges - snap gauges - vernier callipers - vernier height gauge - vernier depth gauge - outside & inside micrometer - stick micrometer - depth micrometer - verniermicrometer - screw thread micrometer xiii) **Fitting operations:** Chipping - filing - scrapping - grinding - sawing - marking - drilling -
reaming - tapping and dieing

c) **Forging**
i) **Hand tools:** Anvil - swage block - hand hammers - sledge hammers - tongs – chisels -swages - fullers - flatters - set hammer - punch and drift
ii) **Equipment:** Open and closed hearth furnaces - hand and power blowers - open and stockfire
iii) **Fuels:**charcoal - coal - oil &gaseous fuels
iv) **Smith Operations:** Upsetting - drawing down - setting down - punching and drifting - bending- welding - cutting - swaging -Fullering and flattering
v) **Machine Forging:** Need of machine forging - forging hammers - spring hammers -pneumatic hammers - steam hammers - drop hammers - Hydraulic press
vi) **Machine forging operations:** - Drawing - upsetting & punchingvii) Tools used in machine forging

d) **Sheet Metal Work (Tin smithy):**
i) **Tools : S**teel rule - circumference rule - thickness gauge - sheet metal gauge - straight edge- scriber - divider -trammel points - punches - chisels – hammers - straight snip - doublecutting shear - squaring shear - circular shear bench & block shears - pliers (Flat nose andround nose) - grocers and rivet sets - soldering iron
ii) **Stakes:** Double seaming stake - beak horn stake - bevel edged square stake -hatches stake- needle stake -blow horn stake -hollow mandrel stake
iii) **Sheet Metal Operations**: ***Shearing***: Cutting off – parting – blanking - punching - piercing -notching - slitting - lancing - nibbling and trimming ***Bending***: Single bend - double bend -straight flange - edge hem - embossing - beading - double hem or lock seam ***Drawing:*** Deepdrawing - shallow or box drawing***Squeezing:*** Sizing - coining - hobbing - ironing - riveting
iv) **Sheet Metal Joints**: Single hem - double hem & wired edge seam joint - lap seam - grooved
seam - single seam - double seam - dovetail seam - burred bottom seam or flanged seam
v) **Fastening Methods**: Riveting - soldering - brazing & spot welding

2) **Foundry:** Development of foundry as a manufacturing process - advantages and limitations of
casting over other manufacturing processes
a) **Hand moulding tools** : Shovel - riddle - rammers - trowels - slicks - lifter - strike - off bar – spruepin - bellow - swab - gate cutter - mallet - vent rod - draw spike - rapping plate - pouringweight - gagger - clamps - spirit level - moulding boxes - snap box & flash box
b) **Sands :**Properties of moulding sand - porosity - flow ability - collapsibility - adhesiveness -cohesiveness - refractoriness - types of moulding sand - Green sand - dry sand - loam sand -facing sand - backing sand - parting sand - core sand - system sand
c) **Pattern making:** Materials such as wood -cast Iron - Aluminium - Brass – Plastics - classificationof patterns such as solid (one piece) - two piece and three pieces - split patterns - gate patternsand shell patterns - sequence in pattern making - pattern allowances and colour codes
d) **Moulding methods**: green sand and dry sand moulding -cement bonded moulding - shellmoulding - Ceramic moulding
e) **Cores**: Need of cores - types of cores
f) **Defects in castings**: Causes and their remedies
g) **Special casting processes:** Die Casting - Centrifugal casting - CO2 process - investment casting

3) **Drilling:**
a) **Drilling machines:**Sensitive & Radial drilling machines - their constructional detail andspecifications
b) **Drill bits:** Terminology - Geometry of twist drill -functions of drill elements
c) **Operations**: Drilling - reaming - boring - counter boring - counter sinking - tapping - spot facing -gang drilling

4) **Sawing:** Hand sawing - Power sawing principles
a) **Metal sawing machines**: Reciprocating saws (vertical and horizontal) saws- Band sawsconstructional
details and specifications of the above
b) **Metal Saw blades:** Types - Angles of saw teeth set - Saw material

5) **Mechanical working of metals:** Introduction to Hot working and cold working
a) **Hot working processes:** rolling - types of rolling - two high mills - three high mills - four high mills- Piercing or seamless tubing - drawing or cupping – spinning- extrusion - direct or forwardextrusion - indirect or backward extrusion - tube extrusion - impact extrusion Effects of hotworking on metals - advantages & limitations of hot working of metals
b) **Cold working processes**: Rolling – drawing - wire drawing - tube drawing –bending - roll forming

- angle bending - spinning - extrusion -squeezing - cold heading - thread rolling – peeningEffects
of Cold working on metals - advantages & limitations of cold working

REFERENCE BOOKS

1. Production Technology by Jain & Gupta
2. Elementary Workshop Technology by HazraChowdary& Bhattacharya
3. Workshop Technology by Raghuvamshi
4. Workshop Technology by Pakirappa.

PRINCIPAL
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SIGNATURE OF CONCERNED LECTURER
SIGNATURE OF PRINCIPAL MECHANICAL

Program Name: DIPLOMA Faculty Name: M.RAMYA

Class	Semester	NAME OF THE SUBJECT	SUBJECT Code	W.E.F
IDME		ENGINEERING DRAWING	M107	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
180 Hours	Theory 3	Practical 3	3	Internal 40	External 60

Programme Outcomes:

1.Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1. Engineering drawing being the principle method of communication for engineers, the objective to introduce the students, the techniques of constructing the various types of polygons, curves and scales.

2. The objective is also to visualize and represent the 3D objects in 2D planes with proper dimensioning, scaling etc.

Course Outcomes:

CO1: Write Free Hand Lettering and Numbers and Understand Dimensioning Practice.

CO2: Understand Principles of Geometric Constructions.

CO3: Understand and draw Principles of Projection of points, lines, planes & solids

CO4: Draw sectional views and true sections of regular solids.

CO5: Convert the isometric view to orthographic view and vice versa.

CO6: Interpret Development of surfaces of different solids.

COURSE CONTENT

1) The importance of Engineering Drawing

Explanation of the scope and objectives of the subject of Engineering Drawing, Its importance as a graphic communication -Need for preparing drawing as per standards – SP-46–1988 – Mention B.I.S - Role of drawing in engineering education – Link between Engineering drawing and other subjects of Study.

2) Engineering drawing Instruments

Classification: Basic tools, tools for drawing straight lines, tools for curved lines, tools for measuring

Distances and special tools like mini drafter & drafting machine – Mention the names under each Classification and their brief description -Scales: Recommended scales reduced & enlarged scales- Lines: Types of lines, selection of line thickness - Selection of Pencils -Sheet Sizes: A0, A1, A2, A3, A4, A5, Layout of drawing sheets in respect of A0, A1, A3 sizes, Sizes of the Title block and its Contents - Care and maintenance of Drawing Sheet

Drawing Plate 1: Consisting of two exercises on use of drawing instruments

3) Free hand lettering & numbering

Importance of lettering – Types of lettering -Guide Lines for Lettering- Practicing letters & numbers of Given sizes (7mm, 10mm and 14mm) Advantages of single stroke or simple style of lettering

Drawing plate 2: Consisting of five to six exercises on freehand Lettering & Numbering

4) Dimensioning practice

Purpose of engineering Drawing, Need of B.I.S code in dimensioning -Shape description of an Engineering object - Dimensioning size, Location features, surface finish, fully dimensioned Drawing - Notations or tools of dimensioning, dimension line, extension line, leader line, arrows, symbols, number and notes, rules to be observed in the use of above tools - Placing dimensions: Aligned system and unidirectional system (SP-46- 1988) - Arrangement of dimensions: Chain, parallel, combined, progressive, and dimensioning by co-ordinate methods - The rules for dimensioning standard features Circles (holes) arcs, angles, tapers, chamfers, and dimensioning of narrow spaces

Drawing Plate 3: Consisting of 8 exercises on Dimensioning methods and rules

5) Geometric Constructions

Division of a line: to divide a straight line into given number of equal parts internally and it‘s examples in engineering applications. Construction of tangent lines: to draw tangent lines touching circles internally and externally. Construction of tangent arcs i) To draw tangent arc of given radius to touch two lines inclined at given angle (acute, right and obtuse angles) ii) Tangent arc of given radius touching a circle or an arc and a given line iii) Tangent arcs of radius R, touching two given circles internally and externally Construction of polygon: Construction of any regular polygon of given side using general method. Conical Curves: Explanation of Ellipse, Parabola, Hyperbola, as sections of a double cone and loci of a moving point, Eccentricity of above curves – Their Engg. applications viz. Projectiles, reflectors, P-V Diagram of a Hyperbolic process - Construction of ellipse by concentric circles method - Construction of parabola by rectangle method - Construction of rectangular hyperbola - General Curves: Involute, Cycloid and Helix, explanations as locus of a moving point, their engineering applications, viz, Gear tooth profile, screw threads, springs etc. - their construction.

Drawing Plate 4: Consisting of eight exercises on construction of polygons

Drawing Plate 5: Consisting of eight exercises on construction of conics

Drawing Plate 6: Consisting of eight exercises on involute, cycloid and helix

6) Projection of points, lines, planes & solids

Projecting a point on two planes of projection -Projecting a point on three planes of projection - Projection of straight line i) Parallel to both the planes ii) Perpendicular to one of the planes iii) Inclined to one plane and parallel to other plane - Projection of regular planes- i) Plane perpendicular to HP and parallel to VP and vice versa ii) Plane perpendicular to HP and inclined to VP and vice versa - Projection of regular solids with i) Axis perpendicular to one of the planes ii) Axis parallel to VP and inclined to HP and vice versa

Drawing Plate 7: Consisting of eight exercises on projection of points and Lines

Drawing Plate 8: Consisting of eight exercises on projection of planes

Drawing Plate 9: Consisting of eight exercises on projection of solids

7) Auxiliary views

Need for drawing auxiliary views - Explanation of the basic principles of drawing auxiliary views, explanation of reference plane and auxiliary plane - Partial auxiliary view.

Drawing plate 10: Consisting of four exercises on auxiliary views

8) Sectional views

Need for drawing sectional views – what is a sectional view - Location of cutting plane – Purpose of cutting plane line – Selection of cutting plane to give maximum information (vertical and offset planes) - Hatching – Section of regular solids inclined to one plane and parallel to other plane

Drawing Plate 11: Consisting of six exercises on sections of solids

9) Orthographic Projections

Meaning of orthographic projection -Using a viewing box model – Number of views obtained on the six faces of the box, - Legible sketches of only 3 views for describing object - Concept of front view, top view, and side view, sketching these views for number of engineering objects - Explanation of first angle projection. – Positioning of three views in First angle projection - Projection of points as a means of locating the corners of the surfaces of an object – Use of mitre line in drawing a third view when other two views are given - Method of representing hidden lines - Selection of minimum number of views to describe an object fully

Drawing Plate 12: Consisting of 12 exercises on orthographic projections of engineering objects.

10) Pictorial Drawings

Brief description of different types of pictorial drawing viz., Isometric, oblique, and perspective and their use - Isometric drawings: Iso axis, angle between them, meaning of visual distortion in dimensions - Need for an isometric scale, difference between Isometric scale, and ordinary scaledifference between Isometric view and Isometric projection - Isometric and Non-isometric lines - Isometric drawing of common features like rectangles, circular shapes, non-isometric lines - Use of box and offset methods

Drawing plate 13: Consisting of 12 exercises on Isometric views of engineering objects

11) Development of Surfaces

Need for preparing development of surface with reference to sheet metal work -Concept of true length of a line with reference to its orthographic projection when the line is (i) parallel to the plane of projection (ii) inclined to one principal plane and parallel to the other -Development of simple solids like cubes, prisms, cylinders, cones, pyramids -Types of development: Parallel line and radial line development -Procedure of drawing development - drawings of trays, funnels, 900 elbow pipes and rectangular ducts.

Drawing plate 14: Consisting of 5 exercises on development problems

REFERENCE BOOKS

Engineering Graphics by P I Varghese – (McGraw-hill)

Engineering Drawing by Basant Agarwal & C.M Agarwal - (McGraw-hill)

Engineering Drawing by N.D.Bhatt.

T.S.M. & S.S.M on ― Technical Drawing‖ prepared by T.T.T.I., Madras.

SP-46-1998 – Bureau of Indian Standards.

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Program Name: DIPLOMA Faculty Name: M.RAMYA

Class	Semester	NAME OF THE SUBJECT	SUBJECT Code	W.E.F
IDME		ENGINEERING DRAWING	M107	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
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Need for drawing auxiliary views - Explanation of the basic principles of drawing auxiliary views, explanation of reference plane and auxiliary plane - Partial auxiliary view.

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Need for drawing sectional views – what is a sectional view - Location of cutting plane – Purpose of cutting plane line – Selection of cutting plane to give maximum information (vertical and offset planes) - Hatching – Section of regular solids inclined to one plane and parallel to other plane

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Meaning of orthographic projection -Using a viewing box model – Number of views obtained on the six faces of the box, - Legible sketches of only 3 views for describing object - Concept of front view, top view, and side view, sketching these views for number of engineering objects - Explanation of first angle projection. – Positioning of three views in First angle projection - Projection of points as a means of locating the corners of the surfaces of an object – Use of mitre line in drawing a third view when other two views are given - Method of representing hidden lines - Selection of minimum number of views to describe an object fully

Drawing Plate 12: Consisting of 12 exercises on orthographic projections of engineering objects.

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Brief description of different types of pictorial drawing viz., Isometric, oblique, and perspective and their use - Isometric drawings: Iso axis, angle between them, meaning of visual distortion in dimensions - Need for an isometric scale, difference between Isometric scale, and ordinary scaledifference between Isometric view and Isometric projection - Isometric and Non-isometric lines - Isometric drawing of common features like rectangles, circular shapes, non-isometric lines - Use of box and offset methods

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REFERENCE BOOKS

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Engineering Drawing by Basant Agarwal & C.M Agarwal - (McGraw-hill)

Engineering Drawing by N.D.Bhatt.

T.S.M. & S.S.M on ― Technical Drawing‖ prepared by T.T.T.I., Madras.

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Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: DIPLOMA　　　　　　　　Faculty Name: G.N.V.MADHUSUDHANA RAO

Class	Semester/year	Name of the Subject	Paper Code	W.E.F
I DME	I	BASIC WORKSHOP PRACTICE	M-108	19/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
120 Hours	Theory	Practical 3	3	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

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the results to solve engineering problems.

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and environmental contexts, and demonstrate the knowledge and need for sustainable

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7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

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8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

To impart hands-on practice on basic engineering trades and skills.

Course Outcomes:

CO1. Prepare the simple jobs as per specification using carpentry tools.

CO2. Prepare the simple jobs as per specification using fitting tools.

CO3. Prepare the simple jobs as per specification using tin smithy tools.

CO4. Prepare the simple jobs as per specifications used in forging tools

Course Content:

1) FITTING SHOP
a) Marking and chipping on Mild – steel flat 6 mm thick
b) Cutting with hack saw M.S. Flats of 6 mm thick
c) Marking, cutting, drilling, Chamfering and tapping on a M.S. Flat 6 mm thick.
d) Assembling of two pieces
e) Matching by filing (6 mm thick M.S. Plate)

2) FORGING SHOP
a) Conversion of round to square
b) Conversion of round to Hexagon
c) Preparation of chisel from round rod
d) Preparation of ring and hook from M.S. round
e) Preparation of a hexagonal bolt and nut

3) CARPENTRY SHOP

a) Cutting of wood with hand saw
b) Planning of wood
c) Planning and chiseling of wood, orientation of wood grain
d) Preparation of dovetail joint
e) Mortise and tenon joint
f) Wood turning on a lathe   g) Preparation of one household article

4) SHEET METAL WORK
a) Cutting Practice on cutting of sheet
b) Formation of joints like grooved joints, locked groove joint
c) Preparation of a rectangular open type tray
d) Preparation of hollow cylinder
e) Preparation of pipe elbow
f) Preparation of mug
g) Preparation of funnel
h) Preparation of utility articles such as dustpan, kerosene hand pump

Signature of Concerned Lecturer   Signature of

Principal

G. Santhi

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Program Name: DIPLOMA Faculty Name:T.LAKSHMI DEVI

Class	Semester	Name of the Subject	Subject Code	W.E.F
I DME	Year end	Engineering Physics Lab	M-109A	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
45 Hours	Theory	Practical 3	3	Internal 20	External 30

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

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10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO1	Applying concepts and solving problems in the branches of Mechanical Engineering such as Basic knowledge of Calculus.
PSO2	Enabling students to understand the concept of different sectors in diploma to uplift their technical levels.

Course Objectives:

1. The students completing this course are expected to understand the concepts of Engineering physics and its applications.

2. The student will able to work n any field with the basic knowledge of physics.

Course Outcomes:

1. Student can able to measure accurately with vernier calipers and screw gauge.
2. Student can able to determine the values of surface tension and viscosity effectively.
3. Student can able to draw the magnetic lines of force.

Course content:

1.0 Practice with Vernier calipers to determine the volumes and areas of a cylinder and sphere and their comparison etc .
2.0 Practice with Screw gauge to determine thickness of a glass plate, cross sectional area of a wire and volumes of sphere and also their comparison etc
3.0 Verify the parallelogram law and Triangle law
4.0 Determine the value of acceleration due to gravity using Simple Pendulum
5.0 Determine the velocity of sound in air at room temperature and its value at zero degree centigrade
6.0 Calculate the Focal length and focal power of convex lenses using distant object method , U-V method, U-V graph and 1 / U – 1 / V graph methods and their comparison,
7.0 Determine the refractive index of a solid using travelling microscope
8.0 Determine the surface tension of a liquid using travelling microscope
9.0 Determine the viscosity of a liquid using capillary method
10.0 Verify the Boyle's law employing a Quill tube
11.0 Determine the specific resistance of material of a wirel using Meter Bridge
12.0 Drawing magnetic lines of force under N-S and N-N methods and locate null points

Signature of faculty. **Signature of Principal**

T.lakshmi devi

Program Name: Diploma Faculty Name: B. Anil Kumar

Class	year	Name of the Paper	Paper Code	W.E.F
I DME	I	Engineering Chemistry Lab	M-110	12-06-2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of year end examination in Hours	Max Marks	
48	Theory	Practical 3	3	Internal 20	External 30

Programme Outcomes:

Program Outcome	
PO1.	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
Selected as application of knowledge of mathematics and science is involved in calculating troubles by chemical methods and instrumental methods of analysis.	
PO2.	Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Selected as students can identify and analyze complex engineering problems and can adopt new methods .	
PO3.	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
Selected as the student can develop chemical and instrumental methods for the public health and safety, and the cultural, societal, and environmental considerations.	
PO4.	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
Selected as students are required to do experiments using electronic devices like	

conductometers, potentiometers.	
PO5.	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
selected as the course apply appropriate techniques and modern engineering tools	
PO6.	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
selected as the contextual knowledge of conductance, potential of materials helps to assess societal, health and safety issues	
PO7.	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
Selected as the course address issues related to environment and sustainability.	
PO8.	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
Selected as the course apply ethical principles and responsibilities and norms of the engineering practice.	
PO9.	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
Not selected as the course does not related.	
PO10.	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
Not Selected as the course does not address complex engineering activities with the engineering community.	
PO11.	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
Not Selected as course does not relate to this.	
PO12.	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
Selected as student can recognize the need for life-long learning in the context of technological change.	

Programme Specific Outcomes:

Programme Specific Outcomes	
PSO 1	Produce graduates who will demonstrate skills required to communicate, collaborate and continue to learn effectively as ethically and socially responsible computer science and engineering professionals.
Not selected as the course does not address any aspects.	
PSO 2	Produce graduates who will be employed as Computer Science & Engineering professionals who serve beyond entry level positions in industrial/R&D organizations and/or be making satisfactory progress in higher degree programs in national/international repute institutes.
Not selected as the course does not address any aspects.	
PSO 3	Predict the changing direction of information technology and evaluate and communicate the likely utility of new technologies to computer science and engineering professionals.
Not selected as the course does not address any aspects.	
PSO 4	Ensure employability and career development skills through Industry oriented mini & major projects, internship, industry visits, seminars and workshops.
Not selected as the course does not address any aspects.	

Course Objectives:

1. The students entering into the professional course have practically very little exposure to lab classes.
2. The experiments introduce volumetric analysis; redox titrations with different indicators; EDTA titrations; then they are exposed to a few instrumental methods of chemical analysis.

Course Outcomes:

* Develop the knowledge of volumetric and instrumental methods of analysis in determining the quality of unknown products.

* Enhance the knowledge how to determine the quantity of the unknown products.

List of Experiments

1. Familiarization of methods of Volumetric analysis- Introduction to chemistry laboratory
2. Preparation of Std Na_2co_3 and making solutions of different dilution solution.
3. Estimation of HCL using std. Na_2co_3 solution
4. Estimation of NaoH using Std. HCL Solution
5. Estimation of H_2so_4 using Std. NaoH solution
6. Estimation of Mohr's salt using Std. $KMno_4$
7. Determination of acidity of water sample
8. Determination of alkalinity of water sample
9. Determination of total hardness of water using Std. EDTA
10. Estimation of chlorides present in water sample
11. Estimation of Dissolved Oxygen (D.O) in water sample
12. Determination of P^H using P^H meter
13. Determination of conductivity of water and adjusting ionic strength to required level
14. Determination of turbidity of water

15. Estimation of total solids present in water sample

Course	PO1 (K3)	PO2 (K1)	PO3 (K6)	PO4 (K6)	PO5 (K6)	PO6 (K6)	PO7 (K1)	PO8 (K3)	PO9 (K3)	PO10 (K2)	PO11 (K5)	PO12 (K2)	PSO1 (K5)	PSO2 (K5)	PSO3 (K5)	PSO4 (K3)
CO1(k6)	3	3	2	2	2	2	3	3	0	0	0	3	0	0	0	0

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: DIPLOMA **Faculty Name: M.Deepika**

Class	Semester	Name of the subject	Subject Code	W.E.F
I	-	Computer Fundamentals Lab	M-111	12/6/18

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory	Practical 3	3 HOURS	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1. The students should know the basic knowledge about Computers and its hardware parts.
2. The students should know about OS installations and Networking Concepts.

Course Outcomes:

1. Study of Diffrerent types of Trouble shooting Techniques.
2. Study of Computer Assembly and Networking concepts.
3. Study about mobile devices, laptops, printers and various security features.

COURSE CONTENT

1. Introduction to personal computers
2. Introduction to lab procedures and tools use
3. Computer Assembly
4. Overview of Preventive maintenance
5. Windows installation
6. Windows configuration and management
7. Networking concepts
8. Applied Networking
9. Laptops and mobile Devices
10. Mobile,Linux and OS X operating systems
11. Printers
12. Security
13. The IT Professional
14. Advanced Trouble Shooting

G. Santhi

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College of Engineering & Technology,
Kothapet, VIJAYAWADA-520 001

Program Name:DIPLOMA Faculty Name:E.Sundesh Babu

Class	Semester	Name of the Subject	Paper Code	W.E.F
II DME	III	Engineeering Mathematics-II	M-301	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory 6	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire practical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1.The students completing this course are expected to understand the basic knowledge on Derivatives as well as Integration.

2.The student shall be able to apply their basic knowledge in various applications.

Course Outcomes:

CO1. Using the concept of Indefinite integral as an anti-derivative.

CO2. Applying Real life applications of definite integrals.

CO3. Using real and repeated, Complex conjugates.

Course Content:

1. Indefinite Integration

A) Concept of Indefinite integral as an anti-derivative.State the indefinite integral of standard functions.Properties of Integrals ∫ (u + v)*dx* and ∫ *ku dx* where *k* is constant and *u, v* are functions of *x.*Solve integration problems involving standard functions using the above rules.
Evaluate integrals involving simple functions of the following type by the method of substitution
$\int f(ax + b)\, dx$ *where* $f(x)\, dx$ is in standard form.
$\int [f(x)]^n f'(x)\, dx$
$\int f'(x)/[f(x)]\, dx$
$\int f\{g(x)\}\, g'(x)\, dx$

B)Integrals of *tan x, cot x, sec x* and *cosec x* using the above.Integrals of the form $\int Sin^m\theta\ Cos^n\theta.\ d\theta$ where m and n are positive integers.Evaluate integrals of powers of *tan x* and *sec x*.
Evaluate the Standard Integrals of the functions of the type.Evaluate the integrals of the type
Evaluate integrals using decomposition method.Evaluate integrals using integration by parts with examples.State the Bernoulli's rule for evaluating the integrals of the form$\int u\,.vdx$.
Evaluate the integrals of the form $\int e^x [f(x) + f'(x)]\, dx$.

2. Definite Integrals & its Applications

A) State the fundamental theorem of integral calculus.Explain the concept of definite integral. Calculate the definite integral over an interval.State various properties of definite integrals. Evaluate simple problems on definite integrals using the above properties.Explain definite integral as a limit of sum by considering an area.Find the areas under plane curves and area enclosed between two curves using integration.Obtain the volumes of solids of revolution.
Obtain the mean value and root mean square value of the functions in any given interval.
Explain the Trapezoidal rule, Simpson's 1/3 rules for approximation of integrals and provide some examples.Write the definition of Laplace Transform and explain sufficient conditions for its existence.
B) Provide formulae for Laplace transforms of standard functions.State Linear property, First shifting property, Change of Scale property for Laplace transforms. Solve simple problems using these properties.Write formulae for Laplace transform of $\int$ in terms of Laplace transform of $f(t)$.
Provide simple examples on these functions.Define unit step function and write the Laplace Transform of unit step function.State second shifting property.Define inverse Laplace Transform and write inverse Laplace Transform of standard functions. Solve simple problems.
Write first shifting property of inverse Laplace Transform with examples
Define convolution of two functions and state convolution theorem with few examples for understanding only.Define Fourier series of a function on the interval $c, c + 2l$ and state sufficient conditions for its existence. Write the Euler's formulae for determining the Fourier coefficients.Find Fourier series of simple functions in the range $(0,2l)$,$(0,2\pi)$, $(-l, l)$ *and* $(-\pi, \pi)$.
Find Fourier coefficients for even and odd functions in the interval $-l, l$ *and* $-\pi, \pi$

in simple examples.Define half range Fourier sine and cosine series of a function over the interval $(0, l)$ with examples.

3. Differential Equations

A) Define a Differential equation, its order, degree Form a differential equation by eliminating arbitrary constants.Solve the first order first degree differential equations by the following methods:Variables Separable,Homogeneous Equations,Exact Differential Equations
Linear differential equation of the form dy/dx + Py = Q,where P and Q are functions of x or constants.Bernoulli's Equation (Reducible to linear form.)Solve Differential equations of the type $(aD^2 + bD + c)y = 0$ when the roots of the auxiliary equation are real and different, real and repeated, Complex conjugates.Solve the higher order homogeneous differential equations with constant coefficients.Explain the concept of complementary function, particular Integral and general solution of a differential equation.
B) Solve n^{th} order differential equation of the type $f(D)\, y = X$ where $f(D)$ is a polynomial of nth order and X is a function of the form k, e^{ax}, $Sinax$, $Cosax$, x^n.Solve simple problems leading to engineering applications.

REFERENCE BOOKS:

1. Integral Calculus Vol.I, by M. Pillai and Shanti Narayan.
2. Thomas' Calculus, Pearson Addison -Wesley Publishers.
3. A Text book of Engg. Mathematics by B.S.Grawel.
4. A Text book of Engg. Mathematics by B.V.Ramana- T.Mc Graw Hill Publishers.

G. Santhi

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Program Name:DIPLOMA Faculty Name:B. HARI KUMAR

Class	Semester	Name of the Subject	Paper Code	W.E.F
II DME	III	STRENGTH OF MATERIALS	M-302	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory 6	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1.The students completing this course are expected to understand the basic terms like stress, strain, poisons ratio…etc and different stresses induced in beams, thin cylinders.

2.The student shall be able to apply their basic knowledge in various applications.

Course Outcomes:

CO1. Understand the concept of stress, strain, types of stress & strain, problem solving techniques for different types of loading.

CO2. Compute the shear force and bending moment for different types of beams with various load condition and also sketch the SF and BM diagram.

CO3. Determine the bending & torsional stresses induced in beams and shafts with different cross sections.

CO4. Determine slope and beam deflection for different beam sections using the appropriate method.

CO5. Determine the different types of stresses involved in thin cylinders.

CO6. Explain the various types of stresses in Springs.

Course Content:

1.Simple Stresses and Strains

1.1.Define the strength, Mechanical properties of commonly used engineering materials.

1.2Identify the nature and effect of tensile, compressive and shear forces.

1.3Define the terms stress, strain

1.4State Hook's law, define the terms Poisson's ratio and elastic modulii

1.5Draw the typical stress - strain curve for ductile and brittle materials under tension indicating salient points on it.

1.6Mention the significance of Factor of Safety.

1.7Write down the relation between elastic constants E,N,K,& 1/m.

1.8Compute stress and strain values in bodies of uniform section and of composite section under the influence of normal forces.

1.9Calculate thermal stresses, in bodies of uniform section and composite sections.

1.10Compute changes in axial, lateral and volumetric dimensions of bodies of uniform sections under the action of normal forces.

2.Strain Energy

2.1Define resilience, proof – resilience and modulus of resilience.

2.2Derive an expression for the strain energy.

2.3Obtain expressions for instantaneous stress developed in bodies subjected to –

Gradually applied load.

Suddenly applied load

Impact/shock load.

2.4 Comparison of proof resilience in bodies subjected to the above loads.

3.Thin Cylindrical Shells

3.1Definition of cylindrical shell

3.2 Definition of longitudinal and hoop stress

3.3 Derive the expression for longitudinal, hoop and shear stress for seamless and seam shells.

3.4 Longitudinal, hoop and volumetric strain and change in dimensions of a seamless shell subjected to internal fluid pressure

3.5 Design of thin cylindrical shells.

4.Shear Force and Bending Moment Diagrams

4.1List the types of beams.

4.2List the types of loading

4.3Explain the terms shear force and bending moment.

4.4Compute shear force and bending moment at any section of beam.

4.5Draw the diagrams of S.F. & B.M for cantilever, simple supported and overhanging beams (for overhanging beams combination of point loads and udl not included)

5.Theory of Simple Bending

5.1State the theory and terms of simple bending.

5.2List the assumptions in theory of simple bending

5.3Derive the bending equation $M / I = \sigma / y = E / R$

5.4Calculate Bending stress, Modulus of section and Moment of resistance.

5.5Calculate the safe load, safe span and dimensions of cross section.

6.Deflection of Beams

6.1Define and explain the term deflection.

6.2State the formulae for deflection in cantilever and simply supported beams under standard conditions

6.3Calculate the values of deflection in the given beams.

7.Torsion in Shafts

7.1Function of Shaft

7.2Explain Polar M.I. of solid and hollow shaft

7.3List the assumptions in theory of Simple Torsion

7.4Derive the torque equation T / J = f_s / R = G□ / L

7.5Design of solid and hollow shafts and power transmitted

7.6Comparison for strength and weight of solid and hollow shafts of the same length and material

8.Springs

8.1Function of spring

8.2Types and applications of springs

8.3Define the terms related to closed coil helical spring

8.4State the formulae for the stress and deflection of closed coil helical spring

8.5Compute the stress and deflection of the closed coil helical spring

8.6Define the terms related to semi-elliptic or leaf spring or laminated spring

8.7State the formulae for the stress and deflection of leaf spring

8.8Compute the stress and deflection of leaf spring

REFERENCE BOOKS:

1. Strength of Materials by Sadhu Singh, Khanna Publishers
2. Strength of Materials by R.S. Khurmi , S Chand & Company
3. Strength of Materials by Ramamrutham, Dhanpatrai Publications

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Program Name:DIPLOMA Faculty Name: G.N.V.MADHUSUDHANA RAO

Class	Semester	Name of the Subject	Paper Code	W.E.F
II DME	III	THERMAL ENGINEERING -I	M-303	18/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory 6	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

To impart the knowledge of the thermodynamic laws and Air standard cycles so as to enable the student to prepare an energy audit of any mechanical system that exchange heat and work with the surroundings.

Course Outcomes:

CO1: Understand the basic laws of perfect gas

CO2. Define the fundamentals of the first and second laws of thermodynamics and working of HE,HP.

CO4. Explain the air standard cycles and discuss the parameters differentiate actual cycles from ASE.

CO5. Calculate Performance parameters like Brake power, Indicated power & various efficiencies.

CO6. Apply thermodynamic laws in engineering applications and demonstrate working of compressors, which are involving energy flows.

1. Perfect gas laws

1.1. Perfect Gas Laws – Boyle‘s law, Charles‘s Law, Avogadro‘s law, Joule‘s law

1.2. Characteristic and universal gas equations (derivations omitted) – relationship between universal
and characteristic gas constants

1.3. Specific heats of perfect gas at constant pressure and at constant volume -Regnault‘s law relationship
between the two specific heats and characteristic gas constant (derivation omitted)

1.4. Simple problems on gas laws and gas equations

2. Fundamentals of Thermodynamics

2.1. Definitions for system, boundary, surroundings, universe, working fluid

2.2. Types of thermodynamic systems – closed, open and isolated systems with examples

2.3. Properties of system- intrinsic and extrinsic properties with examples - definitions for properties
like pressure, volume, temperature, enthalpy, internal energy, density, with their units - definitions for quasi-static work, flow work
2.4. Definitions for thermodynamic State, Path, Process and Cycle – their graphical representation –
concept of reversibility and conditions for reversibility of a process and cycle

3. Laws of Thermodynamics
3.1. Zeroth law of thermodynamics – statement and explanation – its significance – differencebetween heat and temperature - concept of thermal equilibrium
3.2. First law of thermodynamics – its significance – differences between heat and work forms of energy – Joule‘s constant – first law applied to a cycle – simple problems on heat and workconversions in process and cycle
3.3. Non flow energy equation (NFEE) (without proof) – simple problems on the application of NFEE
3.4. Steady flow energy equation (SFEE) (without proof) - simple problems on the application ofSFEE
3.5. Limitations of First law of thermodynamics –development of second law of thermodynamics – itssignificance - Clausius and Kelvin-Planck statements of second law - concept of heat engine,refrigerator and heat pump -thermal efficiency of a heat engine - simple problems on applicationof second law
3.6. Definitions for availability and unavailability – concept of change in entropy – expression forchange in entropy (without proof) – units of change in entropy – significance of change inentropy

4. Thermodynamic processes on gases
4.1. Introduction to popular thermodynamic processes – their mathematical representation –
expressions(without proof) for change in enthalpy, change in internal energy, work transfer, heat
transfer, and change in entropy in these processes - representation of these processes on p -V
and T-s diagrams - simple problems on the following processes:
4.2. Isochoric process
4.3. Isobaric process
4.4. Hyperbolic process
4.5. Isothermal process
4.6. Isentropic process
4.7. Polytropic process
4.8. Isenthalpic process

5. Air standard cycles
5.1. Meaning of air standard cycle –introduction to popular air standard cycles and their practicalapplications
5.2. Carnot cycle – representation on p-V and T-s diagrams - assumptions made – expression (derivation omitted) for thermal efficiency – simple problems
5.3. Otto cycle – representation on p-V and T-s diagrams - assumptions made – expression(derivation omitted) for thermal efficiency – simple problems
5.4. Diesel cycle – representation on p-V and T-s diagrams - assumptions made – expression(derivation omitted) for thermal efficiency – simple problems
5.5. Reasons for the highest efficiency of Carnot cycle over other cycles working between same temperature limits.

6. Internal Combustion Engines

6.1. Heat engines – classification– comparison of EC and IC engines - classification of IC engines layout of an IC engine –functions of principal parts - materials used for the parts - fuels used inIC engines – commerciallyavailable fuels – higher and lower calorific value of fuels
6.2. Layout of four stroke diesel/petrol engine– working cycle - layout of two stroke diesel/petrolengine – working cycle – comparison of four stroke and two stroke engines - comparison ofdiesel and petrol engines- valve timing diagrams for two stroke and four stroke diesel/petrolengines
6.3. Layout of fuel system for diesel engine – functions of principal components – working of fuelpump and injector (line sketches only)- layout of fuel system for petrol engines – functions ofprincipal components -working of a Zenith Carburettor (line sketch only)
6.4. Cooling systems –layout of air cooling system–layout of water cooling system with radiator andforced circulation (line sketches only) - comparison of air cooling and water cooling systems
6.5. Ignition systems – layout of coil ignition system –layout of magneto ignition system - comparisonof the two systems
6.6. Lubricating systems –layout of splash lubrication –practical applications – layout of forcedlubrication system – practical applications
6.7. Governing systems – difference between governor and flywheel – quality and quantity methods
of governing and their applications
6.8. Need of multicylinder engines – advantages over single cylinder engines

7. Performance of IC engines
7.1. Expressions (without proof) for Indicated power, brake power, friction power, mechanicalefficiency, air standard efficiency, indicated thermal efficiency, relative efficiency, brake thermalefficiency, specific fuel consumption – typical values for a healthy engine - Simple problems onthe calculation of the above
7.2. Heat balance sheet – typical layout for a healthy IC engine - simple problems on heat balance
7.3. Morse test – its applications – simple problems
7.4. Expressions (without proof) for minimum air required for complete combustion of a given fuel –simple problems - flue gas analysis for an IC engine given the composition of the fuel (minimumair case only) – simple problems
7.5. Gaseous pollutants in flue gases – need for pollution control – commercially available equipment
for pollution check
8. Air Compressors
8.1. Uses of compressed air – types of air compressors – layout of single stage, single acting,reciprocating air compressor - construction and working – indicator diagram
8.2. Formulae for work done and power required- simple problems on calculation of work and powerrequired
8.3. Advantage of multistage compression - layout of two stage, single acting reciprocating aircompressor – indicator diagram - conditions for minimum work (without proof) - formulae forwork done and power required – simple problems
8.4. Rotary compressors – types – descriptive treatment of centrifugal compressor, axial flow typecompressor and vane type compressors
8.5. Volumetric efficiency of a compressor – typical value for a healthy compressor – simpleproblems on estimation of volumetric efficiency of a compressor

REFERENCE BOOKS

Sno Title of the Book Author Publisher
Elements of Heat Engines, Vol-I, II,R.C. Patel and C.J. Karamchandani
Acharaya Publications , Thermal Engineering R.S.Khurmi S.Chand

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Potti Sriramulu Chalavadi Mallikharjuna Rao
College of Engineering & Technology,
Kothapet, VIJAYAWADA-520 001

SIGNATURE OF CONCERNED LECTURER
SIGNATURE OF PRINICPAL

POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO
COLLEGE OF ENGINEERING & TECHNOLOGY
VIJAYAWADA - 520 001.
Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name: **DIPLOMA** **Faculty Name:**
S.G.S.PRIYANKA

Class	Semester	Name of the subject	Subject Code	W.E.F
II	III	Basic electrical and electronics engineering	M-305	12/6/18

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
75 Hours	Theory 5	Practical	3 HOURS	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1.Comprehend the basic electrical fundamentals and understand the principles and operation of different ac &dc machines.

2. Understand the principles of semiconductors and also know the operation of electrical instruments and their safety in work.

Course Outcomes:

1. Describe different types of laws and networks and analyse various electrical networks.
2. Discuss principle of operation, types of DC Machines and AC machines.
3. Explain the principle of operation of single phase transformer, emf equation.
4. Express principle of operation of alternator and 3-phase induction motors and predict the efficiency and regulation.
5. Recognize PNP and NPN transistors and illustrate their applications as an amplifiers.
6. Understand the working of electrical measuring instruments and safety measures.

COURSE CONTENT

UNIT-1

Basic Concepts and Electro Magnetic Induction

Definitions : Ohm' Law, Laws of resistance work, power, energy with units.
Kirchoff's Laws – Simple problems.
Definitions and units magnetic field strength, flux, flux density, permeability, reluctance.
Definitions and units electric field, field strength, permittivity, capacitance.
Faraday's laws of Electro – magnetic induction.
Dynamically and statically induced e.m.f.
Lenz's Law, Fleming's right hand rule.
Problems on above.
Inductance – self and mutual – coefficient of coupling.
Energy stored in a magnetic field.
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UNIT-2
D.C. Machines

D.C. Generators

a) Principle of operation.
b) Parts of generator and materials use.
c) Types of generators and schematic diagrams.
d) E.M.F equation (No derivation) and voltage current relations.
e) Nomenclature used for determining armature, field and interpole windings etc.
f) Welding Generator.

D.C. Motors

a) Principle of operation.
b) Types of motors and schematic diagrams
c) Back e.m.f and speed equation and relation between voltages and currents.
d) Speed control – field and armature control.
e) Applications of motors.

UNIT-3
A.C. Fundamentals and Machines

Definition – alternating current, voltage amplitude, time period frequency, instantaneous value, Average value, r.m.s. value, form factor.
Graphical and vector representation of Alternating quantities.
Phase difference.
Power in A.C. Circuits and power factor (No Derivation).
Nature of current when alternating voltage is applied to pure resistance, inductance and capacitance – magnitude of current, power factor, power factor angle and power.
Single Phase A.C. Series Circuits.
Single phase series circuits – calculation of impedance, current , power factor, power and voltage drops.
3 – phase circuits

a) Definition of poly – phase and 3 phase circuits.
b) Phase difference in 3 phase system.
c) Star and delta connections, definitions of phase values and line values.

Alternators – principle of working.
Constructional features of alternators.
Speed and frequency relations.
Transformers working principle.
Single phase transformers.

a) Voltage ratio b) Current ratio
c) Turns ration.
b) Welding transformer.Phase Induction Motor Working principle of induction motor.
c) Construction of induction motor
   i) Squirrel cage induction.
d) Wound Rotor induction motor. List the types of Starters used in A.C.machines.Forward

and Reverseunning of Induction motors. Single phase induction motors. Types of single phase induction Motors.

e) Circuit diagram of each type of single Phase induction motor.

f) Forward and reverse running of single Phase induction motors.

g) Applications of single phase induction Motors.

UNIT-4

Semi – Conductors.

Semi – conductors – N-Type, P-type. Behaviour of PN Junction diode Introduction of PNP, NPN Transistors.

Transistor configuration – Zener diodes. Basic Concepts of LED & LCD

UNIT-5

Electrical Measuring Instruments & Safety Procedures.

Construction and principle of operation of moving coil permanent magnet type ammeter and voltmeter and moving iron ammeter and voltmeter.

Construction and working principle of

a) Dynamometer and wattmeter.

b) A. C. Single phase induction type Energy meter.

c) Connection diagram of single phase energy meters with load

Safety Procedures.

a) Effects of shock and burns.

b) Procedures to be adopted in case of electrical shocks.

c) Earthing of electrical equipments.

REFERENCE BOOKS

1. B.L.Theraja. - A Text Book of Electrical Engg. and Electronics.
2. V.K. Mehtha. - Principles of Electronics
3. B.R. Gupta - Fundamentals of Electrical Engg.
4. S.L.Uppal - A Text Book of Elec.Engg & Electronics.

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Program Name: DIPLOMA Faculty Name:MD.RUKSAR SULTANA

Class	Semester	Name of the Subject	Subject Code	W.E.F
II DME	III	Machine Drawing	M-306	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory 3	Practical 3	3	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

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Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1. The student will acquire a knowledge of fastening arrangements such as welding, riveting the different styles of attachment for shaft.
2. The student also is enabled to prepare the assembly of various machine or engine components and miscellaneous machine components.

Course Outcomes:

CO1: Identify the national and international conventions of representing machine components.

CO2: Visualize and draw different views of thread profiles such as V-sharp, whit-worth, Buttress, square, ACME, worm, Bolts & Nuts, keys cotters & pin joints.

CO3: Draw the sectional views of different keys, cotter joints & knuckle joint.

CO4 : Draw sectional views of various riveted joints & shaft couplings and foot step bearings.

CO5: Draw the assembly drawings such as Engine parts, Machine tool parts & accessories.

CO6: Draw the miscellaneous parts (screw jack, swivel bearing, pipe vice) with moderate complexity.

COURSE CONTENT

1.0 Introduction
1.1. Importance of Machine Drawing.
1.2. Brief revision of 1st and 3rd angle projections
1.3. Understand the concepts of Orthographic projections and Sectional views.

2.0 Fastening Devices
2.1. Temporary and Permanent fastenings and their areas of application-thread nomenclature, forms of screw thread profiles, Metric, B.A., Acme, Knuckle, etc.
2.2. Bolts and Nuts: Specification of bolts and nuts, Different types of bolted joints (like using through bolts, studs, screws etc.,) in different applications. Purpose of lock nuts and their Types.
2.3. Keys and cotters: Types of keys and cotters: Difference between key and cotter -uses.
2.4. Rivets and Riveted joints: Types, proportions and specification of rivets: Different types of riveted joints: Lap, Butt-single row, double row etc., chain and zigzag riveting – calculation of diameter of rivet: Pitch and arrangement of rivets in row – use of standard proportions.
Drawing Plate: 1
1. Exercise on Orthographic projections and Sectional views.
2. Thread Nomenclature and forms of screw thread profiles.
3. Exercises in drawing – bolted connections using standard proportions.
4. Drawing of various types of lock nuts & types of keys indicating their proportionate dimensions.
5. Exercise in drawing riveted joints using standard proportions: Single row, Double row (chain and zigzag) in lap and butt joints (single & double strap).

3.0 Assembly Drawings
3.1. Need and functions of assembly and detailed drawings.
3.2. Steps in preparing assembly drawings.
3.3. Bill of materials and parts list.
3.4. Exercises in preparing assembly drawings of commonly available engineering components.

3.5. **Drawing Plate: 2 Draw the views / sectional views of**
Socket and spigot joint
Sleeve and cotter joint
Stuffing box
Knuckle Joint assembly
Bush Pin type flanged coupling
Muff coupling (solid & split)
Universal coupling
Foot step bearing
Plummer block
Eccentric
Lathe tool post
Lathe tail stock
Non return valve

4.0 Piping layouts
4.1. Classification of pipes and tubes.
4.2. Components of pipes lay-out.
4.3. Screw fitting bend, elbow, tee, lateral Cross-nipple, reducing socket and plug.
4.4. Unions: Screwed ground and flanged.
4.5. Valves: Gate valve: angle valve, check valve.
4.6. Various conventional symbol used for the above components.
Drawing Plate: 3
1. Single line diagram of pipe layout, two exercises.
2. Double line diagram of pipe layout, one exercise.
3. Cast iron flanged pipe joint, spigot and socket joint, hydraulic pipe joint, expansion joint, screwed joint, union joint - draw half sectional elevation and end view.

5.0 Welded fabrication drawings
5.1. Different types of weld and their basic symbols including sectional representation as per table of I.S. standards, fillet, square butt, single V-Butt, double V-Butt, single bevel butt, double bevel butt, stud, bead (edge or seal), spot, seam.
5.2. Elements of welding symbol and their standard location, the symbol as per IS standards reference Code, arrow head, weld symbol, supplementary symbol, dimensions of welds, method of welding process, special reference.
5.3. Significance of arrow & position of arrow head significance of reference line as per I.S. standards with reference to fillet, V-Butt and stud welds.
5.4. Supplementary symbols and special instructions: Surface of reference line; as per I.S. standards with reference to fillet, V-Butt and stud welds.
5.5. Dimensions of welds: length, location and spacing of welds as per I.S., B.I.S., standards with showing dimensions required on a welding.
5.6. Need of special reference
Drawing Plate: 4
1. Drawing tables and figs. Referred in the contents above taking form I.S. standards.
2. Dimensioning a given welding drawings as per I.S., SP-46-2003.
3. Preparing working drawing of welding fabrication from given data.

REFERENCE BOOKS

1. T.S.M & S.S.M in respect of **Technical Drawing by TTTI, Madras**
2. Machine Drawing by **A.C. Parkinson**.
3. Machine Drawing by **Jones & Jones.**
4. Machine Drawing by **N.D. Bhat**.
5. Machine Drawing by **R.B. Gupta.**
6. Engineering drawing practice for schools & colleges: **SP-46-2003**.
7. Machine Drawing by **Bhattacharya** (Oxford Publishers).
8. Machine Drawing by **Ajeeth Singh** (MGH Publishers)
9. Machine Drawing by **N.Siddeswar, Kannaih, Sastri**. (MGH Publishers)

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Program Name: DIPLOMA **Faculty Name: S.G.S.PRIYANKA**

Class	Semester	Name of the subject	Subject Code	W.E.F
II	III	Basic electrical and electronics lab	M-307	12/6/18

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
45 Hours	Theory	Practical 2	3 HOURS	Internal 20	External 30

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

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6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

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8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1. The students should able to work and study the different performance characteristics of DC and AC machines
2. Study and measure the insulation and winding resistances of different types of AC and DC machines..

Course Outcomes:

1. Determine the insulation and winding resistances of different types of AC and DC machines.
2. Study of different types of starters and their performance.
3. Analyze the results of load test on AC and DC machines and calculate their characteristics.

COURSE CONTENT

1. Identify of Terminals of the Following DC Machines with the Use of Test Lamp (a) DC Shunt motor (ii) DC Series Motor (iii) DC Compound Motor ..Measuring the values of windings of the Following DC Machines with the Use of Multimeter (a) DC Shunt Motor (ii) DC Series Motor (iii) DC Compound Motor.. Measuring the values of Insulation Resisitance of the Following DC Machines with the Use of Megger. (a) DC Shunt Motor (ii) DC Series Motor (iii) DC Compound Motor..

Identify of Terminals of the Following AC Machines with the Use of Test Lamp
(a) 3-Phase Squirrel Cage Induction Motor (ii) 3- Phase Slip Ring Induction Motor.

Measuring the values of windings of the Following AC Machines with the Use of Multimeter
(a) 3-Phase Squirrel Cage Induction Motor (ii) 3- Phase Slip Ring Induction Motor.

Measuring the values of Insulation Resisitance of the Following DC Machines with the Use of Megger. (a) 3-Phase Squirrel Cage Induction Motor (ii) 3- Phase Slip Ring Induction Motor.

2. Study of Following starters

Identifying the terminals and its operating function of Three Point starter .
Identifying the terminals and its operating function of Four Point starter .
Identifying the terminals and its operating function of DOL (Direct On Line) starter .
Identifying the terminals and its operating function of STAR/ DELTA starter .

3. SPEED CONTROL OF DC SHUNT MOTOR

Able to Draw the Speed Control Characteristics of Dc Shunt Motor By Armature Control method.
Able to Draw the Speed Control Characteristics of Dc Shunt Motor By Field flux Control method.

4. LOAD TEST ON DC SHUNT MOTOR

Draw the Performance Characteristics (Speed, Efficiency) of DC Shunt Motor by load test ..
Understand the Use of Load test on DC Shunt Motor.

5. LOAD TEST ON Three Phase Squirrel cage Induction Motor.

Draw the Performance Characteristics (Speed, Efficiency) of Three Phase Squirrel cage Induction Motor by load test ..
Understanding the Use of Load test on Three Phase Squirrel cage Induction Motor .

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Program Name: DIPLOMA Faculty Name: M.RAMYA

Class	Semester	Name of the Subject	Subject Code	W.E.F
II DME	III	Fuels lab	M-307	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
45 Hours	Theory	Practical 3	3	Internal 20	External 30

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

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Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1. To impart practical exposure to the student on the performance evaluation methods of various types of Fuels characteristics such as flash and fire point, viscosity and calorific value.
2. Student Understand the importance of carbon residue and Calibration of pressure Gauge Apparatus.

Course Outcomes:

CO1: Compute the property of fuels suitable tests.

CO2: Understand the need and importance of calibration of pressure gauges and determination of amount of carbon residue of a given sample of petroleum product.

COURSE CONTENT

1.0 Understand the determination of flash and fire point of a given sample of fuel using given apparatus:

1.1 Define the flash and fire points of fuels and lubricants.

1.2 Distinguish between ―open‖ and ―close‖ tests.

1.3 Identify the Parts of apparatus

1.4 Explain the function of each component part

1.5 Handle the apparatus

1.6 Manipulate the apparatus

1.7 Perform the precise operations to determine flash and fire point of given sample of fuel

1.8 Record the observations

1.9 List the Precautions and safety procedures

1.10 Explain the need and scope of the Experiment in industry

2.0 Understand the determination of Viscosity of a given sample of oil using given apparatus

2.1 Explain the properties of lubricating oil

2.2 Explain the viscosity of oil and its units

2.3 Explain the importance of viscosity as applied to Oils.

2.4 Relate the Absolute viscosity and kinematic viscosity

2.5 Classify the viscometers

2.6 Identify the parts of viscometer

2.7 Handle the apparatus

2.8 Manipulate the apparatus

2.9 Perform the precise operations to record Redwood seconds

2.10 Use empirical formulae to determine the Kinematic & Absolute viscosities of given Oil.

2.11 State the effect of temperature on these oil properties.

2.12 Draw the graph between the temperature and viscosities.

2.13 Explain the need and scope of the Experiment

3.0 Understand the determination of Calorific value of a given sample of fuel using given apparatus

3.1 Explain the phenomenon of combustion of fuel

3.2 Explain the calorific value of fuel

3.3 State the differences between higher and lower Calorific values of fuels.

3.4 List the types of fuels

3.5 Identify the various Calorimeters for determining the Calorific values of Solid, Liquid and gaseous fuels.

3.6 Indentify the parts of Junker‘s Gas Calorimeter

3.7 Handle the apparatus

3.8 Manipulate the apparatus

3.9 Perform precise operations on bomb, Junker‘s Gas Calorimeter or Boy‘s Gas Calorimeter to record various parameters

3.10 Determine the Calorific values of solid, liquid and gaseous fuels

3.11 Explain the need and scope of the Experiment

4.0 Understand the determination of amount of carbon residue of a given sample of petroleum Product

4.1 Explain the phenomenon of oil evaporation

4.2 Identify the parts conradson tester.

4.3 Handle the apparatus

4.4 Manipulate the apparatus

4.5 Perform precise operations on Conradson tester to record Weights of crucible

4.6 Determine the percentage carbon residue

4.7 Explain the need and scope of the Experiment

5.0 Understand the need and importance of calibration of pressure gauges.

5.1 Define the term pressure

5.2 Explain the function of component parts of Dead weight Pressure gauge tester

5.3 State the principle on which the dead weight pressure gauge tester works

5.4 Handle the apparatus

5.5 Manipulate the apparatus

5.6 Perform precise operations on Dead weight Pressure gauge tester

5.7 Observe and record the pressure due to mass load

5.8 Record the gauge pressure

5.9 Explain the need and scope of the Experiment

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Program Name:DIPLOMA Faculty Name:B. HARI KUMAR

Class	Semester	Name of the Subject	Paper Code	W.E.F
II DME	III	MATERIAL TESTING LAB	M-308	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
45 Hours	Theory	Practical 3	3	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

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8. Individual and team work: Function effectively as an individual, and as a member or leader in

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Course Objectives:

1.To impart practical exposure on the microstructures of various materials and their hardness evaluation.

2.To impart practical knowledge on the evaluation of material properties through various destructive testing procedures.

Course Outcomes:

CO1. Predict and interpret the behavior of the material under normal external loads, impact loads and torsion.

CO2. Characterize the micro structures of different ferrous and non-ferrous metals & identify the effect of heat treatment on the hardness of steels.

Course Content:

1. Tension test

1.1. Identify a Universal Testing Machine (UTM)

1.2. State the specifications of the test specimen as per ASTM / IS standards

1.3. Conduct a tension test on the given specimen and calculate

1.3.1. Elastic limit

1.3.2. Yield point

1.3.3. Ultimate point

1.3.4. Breaking Point

1.3.5. Percentage elongation

1.3.6. Percentage reduction in area

1.3.7. Modulus of elasticity

1.3.8. Tensile strength

1.4. Plot a stress strain diagram

1.5. State the significance of the test

2. Compression test

2.1. Identify a Compression testing machine (CTM)

2.2. State the specifications of the test specimen as per ASTM / IS standards

2.3. Conduct a compression test on the given specimen and calculate

2.3.1. Ultimate point

2.3.2. Compression strength

2.4. State the significance of the test

3. Shear test

3.1. Identify a shear attachment for a UTM

3.2. Know the procedure of conducting direct shear test on UTM

3.3. State the specifications of the test specimen as per ASTM / IS standards

3.4. Conduct a direct shear test on the given specimen using UTM and determine the shear strength of the material.

3.5. State the significance of the test

4. Impact test

4.1. Identify Impact testing machines

4.2. Differentiate between IZOD and CHARPY tests

4.3. State the specifications of the test specimen as per ASTM / IS standards

4.4. Conduct IZOD / CHARPY tests on the given specimen, and determine the impact strength

4.5. State the significance of the test

5. Hardness test

5.1. Identify Brinell‘s, Rockwell‘s and Vicker‘s hardness testing machines

5.2. State the specifications of the test specimen as per ASTM / IS standards

5.3. Conduct Brinell‘s /Rockwell‘s /Vicker‘s hardness test on the given specimen, and determine its hardness

5.4. State the significance of the test

6. Torsion test on springs

6.1. Identify spring testing apparatus

6.2. Apply torsion equation to the case of spring deflection

6.3. Conduct a deflection test on the given spring tension / compression spring and determine the modulus of rigidity of the spring material

6.4. State the significance of the test

7. Flexural test on Simply supported beam

7.1. Identify a beam deflection test apparatus

7.2. Apply theory of bending to the case of beam deflection

7.3. Conduct a defection test on the given simply supported beam and determine the modulus of elasticity of the beam material

7.4. State the significance of the test

8. Study of micro structure of Metals and alloys

8.1. Know the procedure of preparing a specimen for micrographic examination

8.2. Identify the tools & equipment required for the above

8.3. Prepare a specimen for micrographic examination

8.4. Draw the microstructure of the given specimen after microscopic examination

8.5. State the significance of the test

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Program Name: DIPLOMA Faculty Name: K. RATNAM

Class	Semester	Name of the Subject	Paper Code	W.E.F
II DME	III	WT-II	M-309	14/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
45	Theory	Practical3	3	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

To impart hands-on practical exposure on manufacturing processes and equipment.Obtain skill in the mould preparation casting ,machining Operations and Welding

Course Outcomes:

CO1. Practising the following machining operations
CO2.Illustrate the Joining of given work pieces by using different welding processes.
CO3. Moulding and casting of Solid bearing ,Flange coupling, Split bearing ,Connecting rod V – Pulley Gear pulley

Course Content:

1. Foundry (moulding and Casting of)
Moulding and casting of
1.1 Solid bearing
1.2 Flange coupling
1.3 Split bearing
1.4 Connecting rod
1.5 V – Pulley
1.6 Gear pulley

2. Machine Shop (Turning)
Practising the following machining operations
2.1 Plain Turning

2.2 Step Turning
2.3 Taper Turning
2.4 Turning Collars
2.5Knurling
2.6 Facing

3. Welding
Practising the welding operations
3.1 Layout of Beads
3.2 Butt joints.
3.3 Lap joints.

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Program Name:DIPLOMA Faculty Name:A. GOPAL

Class	Semester	Name of the Subject	Paper Code	W.E.F
II DME	IV	ENGINEERING MATERIALS	M-401	14/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory 6	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

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7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1.To understand the basic fundamentals of Material science and Physical metallurgy.

2.The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

Course Outcomes:

CO1: Understand the basic concepts of bonds in metals and alloys, basic requirements for the formation of solid solutions and other compounds.

CO2: Understand the regions of stability of the phases that can occur in an alloy system in order to solve the problems in practical metallurgy.

CO3: Distinguish different types of cast irons, steels their properties and practical applications.

CO4: Understand the affect of various alloying elements on iron-iron carbide system, various heat treatment and strengthening processes used in practical applications.

CO5: Understand the properties and applications of widely used non-ferrous metals and alloys.

CO6: Understand the properties and applications of ceramic, composite and other advanced materials.

Course Content:

1.0 Introduction, Mechanical properties of engineering materials

1.1 A few Mechanical Engineering Materials, Importance of their study with applications.

1.2 Various mechanical properties of engineering materials - Tensile strength, Compressive strength, Ductility, Malleability, Hardness, Toughness, Brittleness, Impact strength, Fatigue, Creep resistance

2.0 Testing of materials

2.1 Destructive testing tests on UTM to determine tensile, compressive and shear strengths

2.2 Hardness Tests on Brinell & Rockwell Testing machines - Vickers test principle only

2.3 Impact test using Izod & Charpy specimen

2.4 Non destructive testing – Procedure for testing materials by X-ray, gamma ray, magnetic flux and ultrasonic testing.

3.0 Structure of Materials

3.1 Crystals of metals, Space lattices, Unit cell, three main types of metallic space lattices, namely Face Centered Cubic, Body Centered Cubic, Hexagonal Close Packed.

3.2 Crystallisation of metal, formation of grains by dendrite growth, grain boundary, grain size control, effect of grain size on properties – factors

4.0 Production of Iron and Steel.

4.1 Raw materials, iron ores, Lime stone, Coal-their availability in India.

General Survey of Iron and steel making in India.

4.2 Manufacturing of pig iron from blast furnace.

4.3 Wrought iron by pudding furnace.

4.4 Cast Iron from cupola.

4.5 Production of steel by Bessemer (without sketch), L.D. process; Open hearth (without sketch) and Electric processes.

5.0 Iron - Carbon Equilibrium Diagram.

5.1 Cooling curve for pure metal.

5.2 Allotropic forms of pure Iron.

5.3 Iron carbon equilibrium diagram.

6.0 Heat Treatment of Steels.

6.1 Importance of heat treatment.

6.2 Heat treatment processes – annealing, normalizing, hardening, tempering,

6.3 Case hardening processing c a r b u r i z i n g , nitriding and cyaniding with specific examples of engineering applications of the above.

7.0 Ferrous, Non- Ferrous metals and their alloys.

7.1 Classification of Cast Iron – Grey, White, Malleable, Spheroidal – Composition, properties and applications.

7.2 Plain Carbon Steels: Effect of carbon in steels, Soft, Mild, Medium and High carbon and also their properties and applications.

7.3 Alloy Steels: Nickel Steels, Chromium steels, 18/8 stainless steel, High Speed Steels, Manganese Steel.

7.4 Properties and uses of Copper, Aluminium, Tin, Zinc, Lead, Nickel, Magnesium and Chromium.

7.5 Phosphor bronze, gun metal composition and uses.

7.6 Alnico, magnalium, Y alloy, babbit metal composition and properties.

7.7 composite materials definition, application, terminology, types of composites

8.0 Powder Metallurgy.

8.1 Primary manufacturing process – definition, important characteristic of metal powders,

8.2 Methods of producing powders.

8.3 Forming to shape – pressing, centrifugal compacting., Extruding, Gravity sintering, Rolling, isostatic moulding, explosive compacting, , sintering, Hot pressing, spark sintering,

8.4 Finishing operation.

8.5 Advantages and limitations of powder metallurgy.

REFERENCE BOOKS:

Material Science and Metallurgy – Dr. V.D.kodgire.

Materials Science and engineering - Callister & Baalasubrahmanyam

Material Science for Engineering students – Fischer – Elsevier Publishers.

Material science and Engineering - V. Rahghavan

Introduction to Material Science and Engineering – Yip-Wah Chung CRC Press.

Material Science and Metallurgy – A V K Suryanarayana – B S Publications.

Material Science and Metallurgy – U. C. Jindal – Pearson Publications

G. Santhi

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Program Name: DIPLOMA Faculty Name:G.N.VMADHUSUDHANA RAO

Class	Semester	Name of the Subject	Paper Code	W.E.F
II DME	IV	H&FPS	M-402	16/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90	Theory 6	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

The students completing this course are expected to understand the properties of fluids, its kinematic and dynamic behavior through various laws of fluids like continuity, Euler's, Bernoulli's equations, working of various hydraulic machines like pumps , turbines and fluid power control system

Course Outcomes:

CO1. Understand the concept of fluid and its properties, manometric, hydrostatic forces acting on different surfaces and problem solving techniques.

CO2. Understands the law of continuity and conservation of Energy in respect of liquids

CO3. Evaluate Power transmission through liquids, flowing in the pipes

CO4. Analyse forces, work done and efficiency due to the impact of jets

CO5. Understand the working of hydraulic turbines and pumps

CO6. Understands the working of basic components of Oil power systems & pneumatic power systems

Course Content:

1. Properties of fluids

Definition of fluid; Classification of Fluids: Ideal and Real fluids; Newtonian and Non-Newtonian fluids; Compressible and Incompressible fluids; Fluid properties: Density, specificweight, specific gravity, Specific Volume, viscosity surface tension, compressibility, BulkModulus and capillarity; Concept of pressure: Pascal's law. Atmospheric, Vacuum, Gaugeand absolute pressures; Measurement of pressure: piezo-meter. U-Tube - manometer,differential manometer and bourdon pressure gauge; Simple problems on properties andpressure measurement;

2. Flow of Liquids

Types of fluid flow- Steady and unsteady flow, Uniform and Non-uniform flow, One,Two andThree dimensional flow, Rotational and irrotational flow, Laminar and Turbulent flow;Concept of Reynold's Number; Basic Principles(Laws) of Fluid Motion: Continuity, Energyand Momentum of liquids; Pressure, potential and kinetic energies of liquids, total energy;Continuity equation for one-dimensional flow. Solving of simple problems based on continuityequation. Bernoulli's equation; Problems on Bernoulli's Equation, Venturi meter and Pitottube; Definition of Cv, Cc, and Cd ;

3. Flow of liquids through pipes
Major energy losses: Laws of fluid friction. The equations for loss of head in pipes due tofriction- Darcy's and Chezy's formula (without Minor losses in pipe flow, problems on pipefriction; Minor energy losses; Hydraulic gradient and total energy lines, Pipes in series anparallel, Equivalent pipes, Siphon, power transmission through pipe, Expressions oftransmission efficiency, condition for maximum efficiency; Simple problems on powertransmission through pipes and efficiency of transmission;

4. Impact of jets
Derivation of formulae for the force, work done and efficiency in case of jet striking on a)Fixed vertical flat plate) Fixed inclined flat plate c) Moving flat plate d) Moving Inclined flatplate e) Series of flat plates fixed on the rim of a wheel f) At the centre and at the tip of afixed curved blade g) at the centre and at the tip of a moving curved blade; Simple problemson the above cases;

5. Hydraulic Turbines
Introduction to hydraulic Turbines; Hydro-electric power stations; line sketch showing layoutof hydro-electric power plant; Classification of turbines; Working principle of Pelton wheel,Work done and Efficiencies of Pelton wheel; Working principle of Francis turbine, and Kaplanturbine; Simple Problems on power & efficiency of Francis and Kaplan turbines;

6. Hydraulic Pumps
Classification of pumps; Principle and of operation of a reciprocating pumps (Single acting,double acting pumps); Effect of velocity and acceleration of fluids, in suction and deliverypipes (without proof); Air vessel; Expression for theoretical power required to drive the pump(without proof). Simple problems related to above. Coefficient of discharge, slip, % of slipand negative slip;Principe and operation of centrifugal pump; Comparison betweenReciprocating andCentrifugal pumps; Priming; Work done by the impeller; Static head, Manometric head;Efficiencies- Manometric efficiency, volumetric efficiency, Mechanical efficiency and Overallefficiency; Cavitation and its effect; Simple problems on work, power and efficiency;
7. Oil Power Hydraulics
Basic Components of oil Power system; Applications; Principle and working of pumps (GearPumps, Vane Pump and Piston Pump) used in the oil power systems; Hydraulic Actuators(Single Acting, Double Acting, Telescopic and Tandem); Direction Control Valves; PressureControl Valves; Flow Control Valves;

8. Pneumatics
Basic Components of Pneumatic Power system; Applications (Vehicle door operationsystem, Pneumatic work holding devices, pneumatic braking system); Principle and workingof Filter, Regulator, Lubricator, Muffler, Air control Valves, Quick Exhaust valves, Pneumaticactuators, Pneumatic circuits for control of single acting cylinders and double actingcylinders. Comparison of hydraulic power systems with pneumatic power systems;

REFERENCE BOOKS
1. Fluid power with applications by Anthony Esposito - Printice Hall of India
2. Fluid power control - NPTEL Web course
3. Pneumatics by SRIHARI RAO
4. Pneumatics By TTI
5. Hydraulics & Pneumatics by RAY & RAO

Signature of Concerned Lecturer Signature of

G. Santu

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Program Name:DIPLOMA Faculty Name:A. GOPAL

Class	Semester	Name of the Subject	Paper Code	W.E.F
II DME	IV	THERMAL ENGINEERING -II	M-403	14/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory 6	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1.This course is intended to provide basic knowledge of components being used in steam and gas power plant cycles and to analyse the energy transfers and transformations in these components including individual performance evaluation.

2.The student shall be able to understand basic principles of gas turbines, jet propulsions and rocketry and automobile engineering.

Course Outcomes:

CO1. Analyze the performance of Steam power plant.
CO2. Understand and Classification of Boilers & Performance of Boilers.
CO3. Evaluate the steam turbines.
CO4. Classify & Applications the Steam Condensers.
CO5. Evaluate the performance of Gas Turbines.
CO6. Understand & Working of various Jet Propulsion units and automobile engineering.

Course Content:

1. Properties of steam

1.1. Formation of steam under constant pressure –T-h diagram – saturated liquid line – saturated vapour line – liquid region – vapour region – wet region – superheat region - critical point – significance of critical point

1.2. Concepts of saturation temperature, saturated liquid, sensible heat, latent heat, wet steam, dryness fraction, wetness fraction, saturated steam, superheated steam, degree of superheat

1.3. Expressions (without proof) for specific volume, specific enthalpy, specific external work of evaporation, specific internal energy, internal latent heat, specific entropy, of wet, dry and superheated steam at a given pressure

1.4. Introduction to steam tables - using steam tables to calculate the above properties - simple problems on the above

1.5. Introduction to Mollier chart – simple problems on properties of steam applying the chart

1.6. Industrial uses of steam

2. Steam Generators

2.1. Function and use of steam boilers - classification of steam boiler with examples -comparison of water tube and fire tube boilers – comparison of high pressure and low pressure boilers

2.2. Definition for boiler mountings - need – functions of popular boiler mountings viz. pressure gauge, water level indicator, fusible plug, blow down cock, stop valve, safety valve (sketches omitted) - definition of boiler accessories - functions of popular boiler accessories viz. feed pump, economiser, super heater and air pre-heater (sketches omitted)

2.3. Features of high pressure boilers – layout of a Lamont steam generator - working principle - features of supercritical boilers –layout of Benson boiler–working principle

2.4. Need of steam traps and steam separators – functional difference between the two – layout showing their location in a steam line - recent trends in boilers – introductory treatment of stoker boilers and fluidized bed combustion (FBC) boilers

2.5. Definition of boiler draught – types–natural and artificial – types of artificial draught - layout of natural, forced, induced and balanced draught systems – comparison between artificial and natural draught systems – comparison between induced and forced draught systems

2.6. Definitions of boiler performance parameters viz. Actual evaporation, Equivalent evaporation, Factor of equivalent evaporation, Boiler horse power and Boiler efficiency - formulae for the above terms (without proof) - simple direct problems on the above

3. Thermodynamic Processes on steam

3.1. Calculation of changes in specific volume, specific enthalpy, specific internal energy, specific entropy; and calculation of external work done and heat transferred, for the following processes on wet / saturated / superheated steam, with representation on h-s and T-s diagrams:

3.1.1. Isochoric process

3.1.2. Isobaric process

3.1.3. Hyperbolic process

3.1.4. Isothermal process

3.1.5. Isentropic process

3.1.6. Throttling process

3.1.7. Polytropic process

3.2. layout of separating and throttling calorimeter - experimental determination of dryness fraction of steam using the calorimeter(problems omitted)

4. Steam Nozzles

4.1. Definitions of nozzle and diffuser - types of nozzles – construction of a convergent-divergent nozzle – reasons for its shape - representation of steam flow through it on a Mollier chart – conditions under which the divergent portion acts as a nozzle/diffuser

4.2. Expression for velocity of steam at the exit of nozzle in terms of heat drop with and without friction (derivation omitted) – simple problems applying the expression – definition of nozzle efficiency

4.3. Concept of critical pressure ratio (CPR)in a nozzle – its significance - expression for CPR (derivation omitted) - calculation of cross section areas at throat and exit for maximum discharge simple problems (frictionless cases only)

4.4. Effect of friction in nozzles - super saturated flow in nozzles – choking of nozzles

4.5. Layout of a steam jet injector – working principle – applications

5. Steam Turbines

5.1. Rankin cycle – p-V and T-s diagrams of the cycle – operations of boiler, turbine and condenser on the cycle - definition of steam turbine - classification of steam turbines with examples – comparison of impulse and reaction turbines.

5.2. Layout of a De-Laval turbine –working principle– graphs showing variation of pressure and velocity across the turbine – velocity triangles for the turbine

5.3. Expressions (without proof) for work done, axial thrust, tangential thrust, blade efficiency, nozzle efficiency,stage efficiency of De-Laval turbine – simple problems (without blade friction cases only) using analytical and graphical methods

5.4. Need for reducing rotor speeds of De-Laval turbine– definition of compounding – methods of compounding - velocity compounding, pressure compounding, compounding for both pressure and velocity (graphical representations only)

5.5. Reaction principle - layout of a Parson‘s Reaction turbine – working principle - graphs showing variation of pressure and velocity across the turbine – velocity triangles for the turbine

5.6. Expressions (without proof) for work done, axial thrust, tangential thrust, diagram efficiency, stage efficiency, degree of reaction, blade height of a Parson‘s reaction turbine – simple problems (without blade friction cases only) using analytical and graphical methods

5.7. Definition of a condenser – its necessity in steam power plants – classification of condensers – layout of a shell and tube condenser – working principle - concept of Bleeding and Reheating of steam in steam turbines (Problems omitted)

5.8. Governing of steam turbines – necessity – types – layout of Throttle, By-pass and Nozzle control governing methods – applications of these methods

6. Gas turbines

6.1. Principle of a gas turbine – comparison of steam turbines and gas turbines – comparison of gas turbines and a reciprocating IC engines– classification of gas turbines - applications and limitations of gas turbines

6.2. Joule‘s cycle – its p-V and T-s diagrams –its application to open cycle constant pressure gas turbine – layout of the turbine - working principle

6.3. Application of Joule‘s cycle to closed cycle gas turbine – layout of the turbine – working principle– comparison between open cycle and closed cycle gas turbines

6.4. Atkinson cycle – its p-V and T-s diagrams –its application to open cycle constant volume gas turbine – layout of the turbine - working principle – comparison between constant pressure and constant volume gas turbines

7. Jet Propulsion

7.1. Definition of Jet propulsion – principle – fuels used - applications

7.2. Layout of a turbojet engine - principle of operation – applications

7.3. Principle of Ram effect – layout of a Ram jet engine - principle of operation – applications

7.4. Definition of Rocket propulsion – fuels used in rocket propulsion- comparison with jet propulsion– layout of a Rocket engine – principle of operation – applications

8. Elements of Automobile transmission

8.1. Layout of automobile transmission system – functions of principal components

8.2. Clutch – its functions - layout of a plate clutch (single plate) – working principle – materials used for its principal components

8.3. Gear box – its functions - layout of a sliding mesh (three speed) gear box – working principle – materials used for its principal components

8.4. Differential – its necessity – layout – working principle – layout of rear axle assembly

REFERENCE BOOKS:

Gas Turbines and Propulsive Systems – P.Khajuria & S.P.Dubey - /Dhanpatrai

Gas Turbines / Cohen, Rogers and Saravana Muttoo / Addison Wesley– Longman

Thermal Engineering-R.S Khurmi/JS Gupta/S.Chand.

Thermal Engineering-P.L.Bellaney/ Khanna publishers.

Thermal Engineering-M.L.Marthur & Mehta/Jain bros

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Program Name: DIPLOMA Faculty Name:MD.RUKSAR SULTANA

Class	Semester	Name of the Subject	Subject Code	W.E.F
II DME	IV	Design of Machine Elements	M-405	14/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory 6	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1.The student shall gain appreciation and understanding of the design function in mechanical engineering, the steps involved in designing and the relation of design activity with manufacturing activity

2. Selection of proper materials to different machine elements based on their physical and mechanical properties.

3.Design the mechanical systems for power transmission elements such as gears,belts,ropes,chains,keys and cams.

Course Outcomes:

CO1: Design the size of eye bolt for a given load requirement.

CO2: Design of keys, couplings, shafts for strength and rigidity subjected to combined loading to ensure safe design.

CO3: Design power transmission elements such as belts and chains drives.

CO4: Design of gear drives using Lewis equation for static loading only.

CO5: Select the suitable bearing based on the application of the loads and predict the life of the bearing.

CO6: Design simple cam profile in Uniform velocity, S.H.M, Uniform acceleration and retardation.

COURSE CONTENT

1. Introduction
1.1 Factors governing the design of machine element - nature of load, working stress, mechanical properties of the material of the product, process of manufacture, reliability, durability, Cost, life of product and safety.
1.2 General sequence of steps in designing a machine element.

2. Bolted Joints
2.1 Revision of nomenclature, form of threads – specifications.
2.2 Strength of screwed fasteners and failure of bolts due to different reasons
2.3 stresses due to inital tightening and stresses due to external forces
2.4 stress due to combination of forces – Stresses due to shear loads application.
2.5 Design of Nut – Hexagonal and square shapes only.
2.6 Design of eye bolt for a given load and sketching - using empirical proportions, applications of eye-bolt.

3. Shafts, Keys and Couplings
A) shafts
3.1 Function of shafts and materials used for shafts
3.2 Standard sizes of shafts as per I.S.
3.3 Design of diameters for solid and hollow shafts to transmit a given power at given rpm.,
a) based on strength b) based on rigidity.
3.4 Design of axle.

3.5 Design of shaft/axle/spindle on the basis of Rankine‘s and Guest‘s theory (simple problems 0nly)
Numerical problems
B) keys
3.6 Function of keys and splines specification of splines.
3.7 Materials of keys and splines.
3.8 Discussion over nature of failure of key-effect of key way and the shaft strength.
3.9 Design of a rectangular sunk key considering its failure against shear and crushing – given the power transmitted by the shaft and rpm.
3.10 Design of rectangular sunk key using empirical proportions for given diameter of the shaft. Check for strength.
3.11 Proportions of a spline for a given application using tables.
C) Couplings :
3.12 Function of coupling.
3.13 Types of couplings.
3.14 Rigid flange coupling : Calculation of dimensions for a C.I. flange coupling and coupling bolts for a given torque using empirical proportions – Sketching the flange coupling with the computed dimensions. Numerical problems and sketching.

4. Belts and chain drives
4.1 Factors to be considered while selecting the type of drive
4.2 Belt drive, types of belt drives; belt materials, belt joints
4.3 length of open and crossed belts (without proof).
4.4 Design of stepped pulley belt drive only.
4.5 Expression for the ratio of belt tensions (without proof).
4.6 Concept of centrifugal tension – Relation between centrifugal tension and the tension on tight side for transmitting maximum power (derivation omitted).
4.7 Permissible stress in the belt per unit width : per unit cross section.
4.8 Calculation of belt thickness and width for given permissible stress for open and crossed belts, considering centrifugal tension and without considering centrifugal tension. – simple problems
4.9 Chain drives –advantages-Types of chains – Roller and silent chains. (Design of chains omitted)

5. Gear drives
5.1 Gear tooth terminology – involute and cycloidal profiles
5.2 Gear tooth design using Lewis equation for static loading only.
5.3 Simple, compound, reverted & Epi cyclic gear trains.
5.4 Design of number of teeth for simple, compound and reverted gear trains for a given speed ratio and sketching the arrangement.
5.5 Applications of gear trains –Problems on back gear assembly of lathe – 3- Speed gear box of an automobile.
5.6 Description and application of epi-cyclic gear trains (epicyclic gear trains design omitted)

6. Bearings
6.1 Functions, Types of bearings
6.2 Journal bearing – terminology, McKee‘s Equation, Bearing Modulus Friction in journal bearing, Friction circle, power lost due to friction in bearings, design of Thrust bearing - Power lost in friction, flat pivot and flat collar under conditions of uniform intensity of pressure and wear
6.3 Rolling contact bearings – advantages and disadvantages (design of anti friction bearings omitted)
6.4 Components of rolling contact bearing
6.5 Market or commercial specifications of ball and roller bearings as per BIS standards

7. Cams
7.1 Classification of cams and followers – uses.
7.2 Working principle of plate and cylindrical cams.
7.3 Nomenclature of radial cam.
7.4 Explanations of terms cam profile, base-circle, cam angles, trace point.
7.5 Motion of follower – Uniform velocity, uniform acceleration and retardation and simple harmonic motion – Time Vs. displacement diagram only.
7.6 Construction of cam profile of a plate cam with knife edge & roller follower for all three types of motions stated above.
7.7 Problems on drawing of cam profiles as stated above for the follower axis passes through the axis of the cam shaft (offset followers not included)

8. Fly wheels and Governors
8.1 Purpose and applications of fly wheels – Definitions of Coefficient of fluctuation of speed and Coefficient of fluctuation of energy.
8.2 Turning moment diagram of flywheels
8.3 Formula for energy stored by fly wheel (without proof) – simple problems on design of flywheel

8.4 Governor – function – types
8.5 Explanation of Simple Watt governor and Porter governor
8.6 Define the terms like Sensitiveness, Stability, Isochronism, Hunting, Effort and Power of governor
(design of governors omitted)

REFERENCES

1. Machine Design - R.S.Khurmi - S Chand &Company
2. Design of Machine Elements - Pandya and Shah - Charotar Publishing House.
3 Design of Machine Elements – V B Bhandari - Tata McGraw Hill.
4 Machine Design – R.K. Jain - Khanna Publications

Program Name: DIPLOMA Faculty Name:MD.RUKSAR SULTANA

Class	Semester	Name of the Subject	Subject Code	W.E.F
II DME	IV	Production Drawing	M-406	14/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
45 Hours	Theory 3	Practical 3	3	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1. The student will acquire a knowledge of fastening arrangements such as welding, riveting the different styles of attachment for shaft.
2. The student also is enabled to prepare the part drawing of various machine or engine components and miscellaneous machine components and also prepare process sheet.

Course Outcomes:

CO1: Need of preparing a production drawing, requirements for manufacturing a product like equipment, tools, measuring instruments depending upon processes, accuracy and finish data available in machine drawing.
CO2: Standard symbol of surface finish and indications added to it. Representation of quality of surface finish on the drawing as BIS roughness grade numbers.
CO3: Compute the fit from ISI tables as per the function of the component and indicate the limits at appropriate place on the drawing prepared.
CO4: Prepare the process sheet indicating sequence of processes and equipment, tools, measuring instruments required.
CO5: Prepare the relevant views of the part(s) of a given assembly drawing needed for the purpose of Production.
CO6: Draw the part drawings such as Engine parts, Machine tool parts & accessories.

COURSE CONTENT

1. Introduction and Drawing of component.
1.1 Need of preparing a production drawing, requirements for manufacturing a product like equipment, tools, measuring instruments depending upon processes, accuracy and finish data available in machine drawing – components of a production drawing, fits and tolerances, surface finish, specific processes, material of the component.
1.2 Read a given assembly drawing – study of the functions of the various parts of the assembly drawing.
1.3 Preparation of detailed drawing of a specified part of the assembly.

2. Limits, fits and tolerances.
2.1 Definitions of limits, fits and tolerances.
2.2 Select dimensions from BIS standards to obtain clearance, transition and interference fits for a given set to mating parts – computation of fit and tolerance from BIS table.
2.3 Preparation of drawing of mating parts and representation of fits and dimensional tolerances.
2.4 Representation of geometrical tolerances.
2.5 Exercises in computing tolerance and representation on the drawings for different types of fits.

3. Surface finish.
3.1 Standard symbol of surface finish and indications added to it.
3.2 Representation of quality of surface finish on the drawing as BIS roughness grade numbers.

4. Specifications of materials & standard components
4.1 Materials of the parts of the assembly – size of part, estimation of raw material required for a

component and specification.
4.2 Standard components (parts) like bolts, nuts, bearings etc. – specification of standard parts.

5. Process sheet
5.1 Sequence of processes of production for a particular product.
5.2 Specifications of relevant equipment and tools to obtain the desired accuracy and surface finish.
5.3 Selection of measuring instruments to check the accuracy.

6. Exercises in Production Drawing
Flange Coupling
Universal Coupling
Eccentric
Clapper Block
Connecting rod
Drill jig
Lathe tail stock
Revolving Centre
Knuckle Joint
Plummer Block
Lathe Tool post
Non Return valve
Foot Step bearing
Stuffing box
6.1 Prepare the relevant views of the part(s) of a given assembly drawing needed for the purpose of production.
6.2 Dimension and indicate on it with relevant notes the specific processes.
6.3 Compute the fit from ISI tables as per the function of the component and indicate the limits at appropriate place on the drawing prepared.
6.4 Mark the surface finish symbols with indications added.
6.5 Prepare the process sheet indicating sequence of processes and equipment, tools, measuring instruments required.

REFERENCE BOOKS
1. IS 696 – 1972-Code of Practice for General Engg. Drawing & B.I.S Code – SP . 46. IS 696 – 1988- IS Code on fits and tolerances.
2. Machine drawing by R.B. Gupta.
3. Machine Drawing by Siddeswar.
4. Production Drawing by K.Venkat Reddy
5. Machine Drawing by Nagpal

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Program Name:DIPLOMA Faculty Name: K. RATNAM

Class	Semester	Name of the Subject	Paper Code	W.E.F
II DME	IV	H&FPS LAB	M-407	23/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
45	Theory	Practical3	3	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

To impart practical exposure on the performance evaluation methods of various flow measuring equipment and hydraulic turbines , pumps, oil power hydraulics and pneumatic system

Course Outcomes:

CO1. Calculate the coefficient of discharge through various devices like Venturimeter
CO2. Practice the determination of loss of head in a given pipe

CO3.. Determination of power and efficiency of turbines and pumps

CO4. Familiarisation with oil power hydraulic controls& pneumatic power controls

Course Content:

1. Determination of Coefficient of discharge of Venturimeter.
2. Determination of major losses in pipes due to friction.
3. Determination of B.P. and efficiency of Pelton wheel.
4. Determination of B.P. and efficiency of Kaplan turbine.
5. Determination of B.P. and efficiency of Francis turbine.
6. Determination of I.P. and overall efficiency of a reciprocating pump

7. Determination of I.P. and efficiency of the Centrifugal pump
8. Hands on experience on oil power hydraulic trainer
9. Hands on experience on pneumatic power trainer

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Program Name: DIPLOMA Faculty Name:G.SIRISHA

Class	Semester	Name of the Subject	Subject Code	W.E.F
II DME	IV	COMMUNICATION SKILLS	M-408	14/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
45 Hours	Theory	Practical 3	3	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1. Understand and strengthen their listening skills.

2. Understand and strengthen their speaking skills.

Course Outcomes:

CO1 : Understand the abilities of communication.

CO2: Understand and improve the opportunity for practicing speaking.

Content

Content

Topic	Teacher's input/ methodology	Students competence
Listening I Listening II	Pre- Listening –eliciting, pictures While - Listening Post –Listening –project , writing	Identifying the main idea, Identifying specific details, Identifying parallel and contradictory ideas Drawing inferences, Reasoning
Introducing oneself	Kinds of introduction --official/ personal, dynamic vocabulary, Body language, Model introduction, Use of line ups	Use of simple present tense, Sequencing, Appropriate vocabulary
Reporting incidents	Group work /pair work, Elicit, Use of past tense, Student presentations	Use of past tense, Relevant vocabulary
Describing objects	Vocabulary , Use of adjectives, Games—I spy, Group presentations	Use of adjectives, Dimensions,shapes Compare and contrast, Sequence
Describing events	Group work/pair work Use of appropriate tense	Use of appropriate tense, Sequencing
Reporting past incidents	Use of past tense, Vocabulary Student presentations	Use of past tense , sequencing

Speaking from observation/reading	Group work/pair work, Reading techniques ,	Use of past tense, Summarising , evaluating, comprehension
JAM	Effective techniques , Good beginning , conclusion, tips, Use of line ups	Vocabulary, Sequencing, Fluency, Thinking spontaneously
Group discussion	Expressing opinion, body language,	Expressing opinion, agree/ disagree, fluency,Persuasive and leadership skills
Mock interview	FAQs , body language	Role play, body language,
Making presentations	Student presentations	Using charts , pictures, interpreting data, sequencing,PPTs

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Program Name:DIPLOMA Faculty Name:B. HARI KUMAR

Class	Semester	Name of the Subject	Paper Code	W.E.F
II DME	IV	THERMAL ENGINEERING LAB	M-409	14/11/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
45 Hours	Theory	Practical	3	Internal	External
		3		40	60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1.To impart practical exposure to the student on the performance evaluation methods of various types of internal combustion engines and compressors.

2.Student shall be able to perform servicing and maintenance of automobile engine.

Course Outcomes:

CO-1: Demonstrate the performance of internal combustion engines and air compressors.

CO2. I.C. Engines valve / port timing diagrams.

I.C. Engines performance test (4 -stroke diesel engines)

I.C. Engines performance test on 2-stroke petrol.

Evaluation of engine friction by conducting morse test on 4-stroke multi cylinder petrol engine.

Determination of FHP by retardation and motoring test on IC engine.

I.C. Engines heat balance.

Economical speed test of an IC engine.

Performance test on variable compression ratio engines.

Performance test on reciprocating air compressor unit.

CO3: Dis-assembly / assembly of Engines.

Course Content:

1. **Study of valve timing diagrams for four stroke engines**

1.1. Identify the inlet and outlet valves of a four stroke IC engine

1.2. Illustrate the mechanism used for valve operation

1.3. Draw a hypothetical VTD for four stroke IC engines

1.4. Draw a practical VTD for four stroke diesel engines

1.5. Draw a practical VTD for four stroke petrol engines

1.6. State the effect of valve timing on performance of the engine

2. **Study of port timing diagrams for two stroke engines**

2.1.Identify the ports of a two stroke IC engine

2.2.Draw a hypothetical PTD for two stroke IC engines

2.3.Draw a practical PTD for two stroke diesel engines

2.4.Draw a practical PTD for two stroke petrol engines

2.5. State the effect of port timing on performance of the engine

3. Performance test on a diesel engine

3.1. State the scope of performance test on an engine

3.2. Identify the various components of the test rig

3.3. Draw the experimental layout of the test

3.4. List out the tools and equipment required for conducting the test

3.5. State the observations to be made

3.6. Calculate the performance parameters – Indicated power, Brake power, Friction power, Mechanical efficiency, Indicated thermal efficiency, Brake thermal efficiency, specific fuel consumption etc.,

3.7. Draw the performance curves

3.8. Compare with the ideal performance curves and comment on the performance of the engine

4. Performance test on a petrol engine

4.1. State the significance of performance test

4.2. Identify the various components of the test rig

4.3. Draw the experimental layout of the test

4.4. List out the tools and equipment required for conducting the test

4.5. State the observations to be made

4.6. Calculate the performance parameters – Indicated power, Brake power, Friction power, Mechanical efficiency, Indicated thermal efficiency, Brake thermal efficiency, specific fuel consumption etc.,

4.7. Draw the performance curves

4.8. Compare with the ideal performance curves and comment on the performance of the engine

5. Heat balance sheet on a diesel engine

5.1. State the scope of the Heat balance test on the engine

5.2. State the significance of the test

5.3. Identify the various components of the test rig

5.4. Draw the experimental layout of the test

5.5. List out the tools and equipment required for conducting the test

5.6. State the observations to be made

5.7. Calculate the heat equivalent of brake power, cooling water loses, flue gas loses, radiation loses etc.,

5.8. Draw a heat balance sheet for the engine

5.9. Compare it with that of an ideal engine and comment on the performance of the engine

6. Economic speed test on a petrol engine

6.1. State the significance of the test

6.2. Identify the various components of the test rig

6.3.Draw the experimental layout of the test

6.4.List out the tools and equipment required for conducting the test

6.5.State the observations to be made

6.6.Estimate the range of economic speed for the engine

7. Morse test on multicylinder engine

7.1. State the scope of the test

7.2. Identify various components of the test rig

7.3. Draw the experimental layout of the test

7.4. List out the tools and equipment required for conducting the test

7.5. State the observations to be made

7.6. Calculate the Brake power, Indicated power, Friction power, and Mechanical efficiency of the engine

8. Volumetric efficiency of air compressor

8.1.State the scope of the test

8.2.State the significance of the test

8.3.Identify various components of the test rig

8.4.Draw the experimental layout of the test

8.5.List out the tools and equipment required for conducting the test

8.6.State the observations to be made

8.7.Calculate the volumetric efficiency of the compressor8.8.Compare the value with that of an ideal compressor, and comment on the performance of the compressor

9. Servicing & Maintenance of an automobile engine

9.1. Dismantle a two wheeler engine for servicing

9.2. Assemble the engine in proper sequence

9.3. Draw a preventive maintenance chart for a two wheeler engine

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Program Name: **DIPLOMA** **Faculty Name: S.G.S.PRIYANKA**

Class	Semester	Name of the subject	Subject Code	W.E.F
III	V	INDUSTRIAL MANAGEMENT AND SMART TECHNOLOGIES	M-501	12/6/18

SYLLABUS

Total No. of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
Hours 75	Theory 5	Practical	3 HOURS	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

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6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

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8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

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10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1. Understand the principles of management as per the industry and know the organization structure and its different aspects in the field of production and materials management.
2. Comprehend the Importance of Maintenance Management & Safety procedures and should have an impact on smart technologies.

Course Outcomes:

1. Know types of ownerships, the organisation structure of an industry and the behaviour of an individual in an organization.
2. Understand the different aspect of production management and the role of materials in management industries.
3. Comprehend the Importance of Maintenance Management & Safety procedures
4. Understand the role of entrepreneur in economic development and in improving the quality of life
5. Understand the concepts adopted in total quality management
6. Describe the importance of smart technologies and their role in the present world

Course Content

1. **Basics of Industrial Management**

Introduction: Industry, Commerce and Business; Definition of management; Characteristics of management; Functions of management - Planning, Organizing, Staffing, Directing, Co- ordination, Controlling, Motivating, Communication, Decision Making; Principles of scientific management: – F.W.Taylor, Principles of Management: Henry Fayol; Administration and management; Nature of management; levels of management; managerial skills;

2. **Organisation Structure & organisational behaviour**

Organizing - Process of Organizing; Line/Staff and functional Organizations, Decentralization and Delegation, Effective Organizing; Communication, Motivational Theories; Leadership Models; Human resources development; Forms of Business ownerships: Types – Sole proprietorship, Partnership, Joint Stock Companies, Cooperative types of Organizations; Employee participation in management; Corporate Social responsibility;

3. **Production management**

Definition and importance; Plant location and layout; Types of production -job, batch and mass; production Planning and Control: Demand forecasting, routing, scheduling, dispatching and follow up; Break even analysis; Supply chain Management (Definition, Competitive strategy Vs Supply chain Strategy, Supply chain drivers); Project scheduling; Application of CPM and PERT techniques; simple numerical problems;

4. **Materials Management**

Materials in industry, Basic inventory control model, ABC Analysis, Safety stock, re-order level, Economic ordering quantity, Stores Management: Stores layout, stores equipment, Stores records, purchasing procedures, e-tendering, e-procurement; purchase records, Bin card, Cardex RFID (Radio Frequency Identification Device)application in materials management;

5. **Maintenance Management & Industrial Safety**

Objectives and importance of plant maintenance, Different types of maintenance, Nature of maintenance problems, Range of maintenance activities, Schedules of preventive maintenance, Advantages of preventive maintenance, 5 S principles; Importance of Safety at work places; Causes of accidents-psychological, physiological and other industrial hazards; Domino sequence;

hods of promoting safe practices; Pollution control in process industries; Introductory concepts on Solid waste management (General introduction including definitions of solid waste including municipal, hospital and industrial solid waste, Waste reduction at source – municipal and industrial wastes)

6. **Entrepreneurship Development.**

Definition of Entrepreneur; Role of Entrepreneur; Concept of Make In India, ZERO defect, Zero Effect, Concept of Start-up Company, Entrepreneurial Development: Role of SSI, MSME, DICs, Entrepreneurial development schemes; Institutional support, financial assistance programmes; Market survey and Demand survey; Preparation of Feasibility study reports

7. Total Quality Management:

Total Quality Management (TQM)- Concept of quality discussed by B. Crosby W. Edward, Deming, Joseph M. Juran, Kooru Ishikawa, Genichi Taguchi, Shigco Shingo. Quality systems – Definitions of the terms used in quality systems like, quality policy, quality management, quality systems, Stages of development of ISO 9000 series , ISO-14000, Deming's PDCA Cycle (Plan, Do, Check and Action). Japanese Quality Management, culture, Kaizen Strategy (continuous improvement).

8. Smart Technologies :

Overview of IoT - Define IoT, how IoT work, key features of IoT, components of IoT : hardware, software, technology and protocols, advantages and disadvantages of IoT - IoT Applications - Smart Cities, Smart Energy and the Smart Grid, Smart Transportation and Mobility, Smart Home, Smart Buildings and Infrastructure, Smart Factory and Smart Manufacturing, Smart Health, Food and Water Tracking and Security, Participatory Sensing, Social Networks and IoT.

REFERENCE BOOKS

1. Industrial Engineering and Management -by O.P Khanna
2. Production Management- by Buffa.
3. Engineering Economics and Management Science - by Banga & Sharma.
4. Personnel Management by Flippo.
5. Production and Operations Management –S.N. Chary
6. Converging_Technologies_for_Smart_Environments_and_Integrated_Ecosystems_IERC _Book_ Open_Access_2013 pages-54-76
7. Supply Chain Management –Sunil Chopra and Meindl, PHI publishers
8 5 S made easy by David Visco

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Program Name:DIPLOMA Faculty Name:B. HARI KUMAR

Class	Semester	Name of the Subject	Paper Code	W.E.F
III DME	V	INDUSTRIAL ENGINEERING AND ESTIMATION AND COSTING	M-502	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory 6	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1.To impart fundamental knowledge and skill sets required in the Industrial Management and Engineering profession, which include the ability to apply basic knowledge of mathematics, probability and statistics, and the domain knowledge of Industrial Management and Engineering.

2.To enable students to understand their role as engineers and their impact to society at the national and global context.

Course Outcomes:

CO1.Stakeholder will acquire fundamental knowledge of Industrial Management and Engineering profession and its importance, overview of Scientific Principles of Management, various tools of Industrial Engineering &Productivity measurement.

CO2. Stakeholder will understand the concept of system approach to design, develop, and implement different types of production layouts, process layouts that include people, materials, information, equipment and energy and also acquire the domain knowledge of maintenance.

CO3. Stakeholder will be able to understand different types of production, Work Study - to eliminate unproductive activities, Method Study - to use the Charts to record the Activities of the people, materials and Equipment to find alternative methods which minimize waste, Work Measurement Techniques - to improve the processes and find the Standard Time, Ergonomics - to design the Man –Machine System to improve Human Efficiency and reduce the effort of the workers, knowledge about Flow Process Charts and Therbligs.

CO4. Stakeholder will be able to identify the role of statistics in engineering problem solving process and know methods that engineers use to collect data for making decisions, able to construct and interpret data displays and understand how these graphical techniques are useful in uncovering and summarizing patterns in data and will acquire knowledge about various quality systems.

CO5. Stakeholder will understand the importance of Human Resource function in planning and staffing organizational manpower requirements, fundamental concepts, principles, techniques

and programs in determining HR planning, the role of HR planning in functions such as training and development, compensation and benefits programs, payroll, performance management and health and safety at work, appraise a job-based compensation scheme that is consistent with organizational goals, mission and values, various methods and incentive plans.
CO6. Stakeholder will be able to use the techniques, skills, and modern engineering tools necessary for engineering practice with appropriate considerations for public health and safety, cultural, societal, and environmental constraints to reduce the cost of a product without compromising with its quality, reliability &performance, function effectively within multi-disciplinary teams and understand the fundamental precepts of effective project management

Course Content:

1. **Introduction:** Definition of industry and industrial engineering, scope and role of industrial engineering fields of applications. Productivity:Production and productivity; Work Study: Introduction, its relation with productivity aims, objectives and application of work study, basic procedure and techniques of work study.

2. **Method Study:** Definition objectives, basic procedures of methods study. Recording techniques, operation process chart, flow process chart, machine chart, flow diagrams, string diagrams, two hand process charts, questioning technique procedure to develop, install and maintain new methods. **Micro Motion Study:** Definition and objectives, techniques of micro motion study, Therbligs and their symbols, use of therbligs, SIMO chart and its application;

3. **Work Measurement:** Procedure of stop watch time study, General rules for breakdown of job into elements; performance rating, its meaning, standard rating, rating of operators, conditions for operators variation at work place rating scales, rating factors, calculation of basic time. Allowances- purpose, types. Determination of Standard time through Work Sampling, Predetermined motion time standard, standard data;

4. **Quality Control**: Introduction to Statistical Quality Control; Basic Quality tools for process improvement; Chance and Assignable causes of Quality variation, Advantages of shewhart control charts, Process Control charts for variables, X, R; Control Charts for attributes: P-Chart, nP Chart and 100p Chart. Product Control: Acceptance Sampling; 100% Inspection, operating characteristic curve (O.C. curve);Single, Double and Multiple sampling Plans, SSPlan; Producers Risk and Consumer‘s Risk, Indifference Quality level, Average Outgoing quality (AOQ) curve, AOQL; ABC Standard; Six sigma steps (Define-D, Measure-M, Analyze-A, Improve-I, Control-C);

5. **Fundamentals of estimation and Costing:**Objectives and functions of estimation; Principal constituents of the estimation; estimation procedure: Labour, materials, overheads, miscellaneous expenses; Objectives of cost accounting – elements of cost viz., material, labour and expenses – Calculate the selling price of a product; Depreciation-causes-Calculation of depreciation charges by a few important methods (Straight line method, Sinking fund method, Reducing balance method, Sum of Years digits method)

6. **Estimation of weights and Volumes of materials** : Principles of dividing the component drawing into simple and smaller geometrical configurations; Calculation of volumes and the weight of the material; Estimating the cost ; Exercises in the calculation of weight of material and cost.

7. **Estimation of Machining Times:** Basic formula for the calculation of machining times for operations like, turning, drilling, shaping, boring, screw cutting and grinding,. Use of standard table of feeds, cutting speed etc; Exercises for the calculation of machining time for the above mentioned operations.

8. **Estimation of welding, forging and Foundry cost:** Estimate the cost of fabrication by gas welding and arc welding; Estimation of Forging Cost: Estimation of stock weight, net weight, gross weight, losses in forging; Exercises in the estimation of length, net and gross weight and cost of forging for given components. Estimation of foundry cost: Process for finding the foundry cost, cost of metal, cost of metal melting, moulding, core cost, cleaning cost, grinding and tooling cost. Exercises in estimating the foundry cost.

REFERENCE BOOKS:

Industrial Management by Bhattacharya DK, Vikas publishers.

Operations Management by J.G Monks, McGrawHill Publishers.

Industrial Engineering by Banga & Sharma.

Principles of Management by Koontz O' Donnel, McGraw Hill Publishers.

Statistical Quality Control by Gupta.

Industrial Engineering and Management by Raju, Cengage Publishers.

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Program Name:DIPLOMA Faculty Name:B. HARI KUMAR

Class	Semester	Name of the Subject	Paper Code	W.E.F
III DME	V	REFRIGERATION AND AIR CONDITIONING	M-503	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
75 Hours	Theory 5	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal

and environmental contexts, and demonstrate the knowledge and need for sustainable

development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms

of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in

diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1.The course is to understand the basic cycles of various refrigerating systems, their performance evaluation along with details of system components and refrigerant properties.

2.The course is also aimed at imparting knowledge of psychrometric properties, processes which are used in airconditioning systems for comfort and industrial applications.

Course Outcomes:

CO1. Illustrate the basic concepts of refrigeration system.
CO2. Analyze the vapour compression cycle and interpret the usage of refrigerants.
CO3. Explain the components of vapour compression system.
CO4. Demonstrate the use of psychometric in analyzing refrigeration systems.
CO5. Use P-h, T-S and Psychometric charts to solve refrigeration and Air conditioningDesign problems

CO6. Discuss the theory and concept of air-conditioning systems.

Course Content:

REFRIGERATION

1. Fundamentals of Refrigeration and Air Refrigeration:

1.1. Introduction – Definition and meaning of refrigeration,

1.2. Methods of refrigeration

1.3. Unit of refrigeration and COP

1.4. Simple problems.

1.5. Thermodynamic analysis of Refrigeration cycles- Carnot refrigeration cycle- Air refrigeration cycle (Bell – Colomen)(problems on air cycles omitted)

1.6. Open air and closed air systems of refrigeration

2. Vapour Compression Refrigeration Systems.

2.1. Working of VC system with p-h and T-s diagrams- Expression for COP (derivation omitted) –

2.2. Factors effecting the COP viz. Sub cooling, superheating, pressure changes

2.3. Functions of flash chamber and accumulator (sketches omitted)their location in VC circuit

2.4. Simple problems on COP.

3. Vapour absorption Refrigeration Systems

3.1. Layout of vapour absorption system – principle of working – expression (without proof) for C.O.P –

3.2. List of popular refrigerants and absorbents – two fluid & three fluid systems

3.3. Layout of Electrolux refrigerator – working principle

3.4. Comparison of vapour absorption and vapour compression systems.

4. Refrigeration Equipment :

4.1. Compressors – Classification and sub classification – working of Hermetic and semi hermetic type compressors with sketches – Rotary compressors – working of vane type and screw type compressors with sketches

4.2. Condensers –Classification – layout of Air cooled, water cooled, Evaporative types – their working

4.3. Evaporators – types of evaporators - working principle of shell and tube and dry evaporators with sketches – flooded type – working

4.4. Expansion devices – types of expansion devices- working principle of capillary tube and thermostatic expansion devices with sketches

4.5. Driers – types – working principle of refill type and throw away type driers.

5. Refrigerants & Refrigeration Applications :

5.1. Primary and secondary refrigerants with examples – requirements of a refrigerant – properties of refrigerants – Commonly used refrigerants

5.2. Applications of refrigeration – working principle (with line sketches) of

5.2.1. Domestic refrigerator

5.2.2. ice plant

5.2.3. Water cooler

5.2.4. Cold storage.

AIR CONDITIONING

6. Fundamentals of A/c and A/c equipment

6.1. Definition of air conditioning – concept of Comfort air conditioning

6.2. Factors affecting human comfort – comfort chart

6.3. A/C Cycle equipment such as fans, supply ducts, outlets, return outlets and ducts

6.4. Air distribution- Radial perimeter system, loop perimeter system, extended plenum system

6.5. Filters & dust collectors –wet, dry, electric & viscous types, Cyclone air cleaner, air washer

6.6. Heating and cooling coils

7. Psychrometry

7.1. Psychrometry – Psychrometric terms – Practical applications of psychrometric terms

7.2. Psychrometric processes

7.3. Psychrometric chart – Simple direct problems applying psychrometric chart

7.4. Psychrometric patterns for heating & cooling processes.

8. Applications of Air conditioning

8.1. Working principle with layout for the following air conditioning appliances:

8.1.1. Air coolers

8.1.2. Window air conditioner – (split & package type)

8.1.3. Cooling towers

8.1.4. A/C systems for human comfort – summer/winter/year round air conditioning, central A/C system and unitary system

REFERENCE BOOKS

Refrigeration and Air Conditioning – by Domakundavar

Refrigeration and Air Conditioning – by Arora (MGH Publishers)

Basic Refrigeration and Air conditioning – by P N Ananthanarayana,(MGH Publishers)

Refrigeration and Air Conditioning – by Sarao & Gabi,

Refrigeration and Air Conditioning – by Dosatt

Refrigeration and Air Conditioning – by Stoecker

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Program Name: DIPLOMA Faculty Name: MD.RUKSAR SULTANA

Class	Semester	Name of the Subject	Subject Code	W.E.F
III DME	V	Computer Aided Manufacturing Systems	M-505	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
75 Hours	Theory 5	Practical	3	Internal 20	External 80

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1. Understand the basic fundamentals of computer aided design and manufacturing.

2. To learn the part programming, importance of group technology, computer aided process planning, computer aided quality control.

Course Outcomes:

CO1 : Understand the role of computers in industrial design and manufacturing a product, describe the concept of product cycle.

CO2: Understand the fundamental concepts of Automation, Numerical control their various design features of NC machine tools.

CO3 : Understand the fundamental concepts of Automation CNC AND DNC control, CNC-CMM their various design features of NC machine tools.

CO4 : Develop part programming and principles of APT programming and solve simple problems.

CO5: Understand the basics of automation and applications of Robotics.

CO6: Identify the various elements and their activities in the Computer Integrated Manufacturing.

COURSE CONTENT

1. Introduction to Computer aided manufacturing (CAM)
1.1. Role of computers in manufacturing–Computer aided monitoring and control –computer aided manufacturing support functions viz. CAD, CADD,CAE, CAPP,CATD – Benefits of CAM
1.2. Product cycle in traditional and computerized manufacturing environments – linkage of various manufacturing functions through computerized database– Integrated CAD/CAM
1.3. Types of production systems –Transfer line production – Flexible manufacturing system – Standalone CNC system – features and applications of each type
1.4. Group Technology – advantages and limitations

2. Introduction to Numerical Control
2.1. Brief overview of historical development of Numerical control technology – advantages over conventional manufacturing system – Limitations – applications
2.2. Working principle of NC machine tool- elements of NC machine tool
2.3. Manufacturing methodology of NC systems – Part drawing – Part program – Program tape –Tape reader – Controller – Machine tool
2.4. Numerical control modes – Point to point control – One axis control – Simultaneous two axes control – Simultaneous three axes control

3. CNC and DNC systems
3.1. Working principle of CNC machine tool – Principal differences over NC systems – advantages over NC system
3.2. Direct Numerical control – concept – features – advantages –applications

3.3. Comparative treatment of NC, CNC, and DNC systems
3.4. CNC Co-ordinates measuring machine (CNC-CMM) – Principle of working – Principal components – features – advantages – applications

4. Basic principles offence hardware
4.1. Principles of CNC machine tool bed and Spindle design – Spindle drives and Feed drives – DC servo motors – AC servo motors – Stepper motors – Linear motors
4.2. Actuation systems – lead screw with recirculating balls and nut –Antifriction guide ways – Linear ball bush
4.3. Feedback devices – Closed loop CNC control system – Absolute encoders (natural binary & gray) – Incremental encoders
4.4. Materials for cutting tools used in CNC – Cemented carbides – Coated carbides – Ceramics
4.5. Tool holding devices – Drum type and chain type Tool magazines
4.6. Working of automatic tool changer (ATC)
4.7. Work holding devices – Grid plate –Tomb stone

5. CNC programming
5.1. Steps involved in development of part program – Process planning –Axes nomenclature for CNC turning and machining centres – Tool selection – Cutting process parameters selection – Job and tool setup planning – Machine tool path planning – Part program writing – Part program verification
5.2. Manual part programming (as per ISO) – Word address format –meaning of each word – List of preparatory functions – List of miscellaneous functions
5.3. Tool length compensation – Nose radius compensation – Cutter radius compensation
5.4. Computer aided part programming (CAP) – advantages over manual part programming
5.5. List of Geometry, Motion, Post processor and Compiler commands used in APT
5.6. Sample programs for simple turning jobs in G & M codes
5.7. Sample programs in APT for simple Drilling jobs
5.8. Overview of commercially available GUI based CAP programming languages – advantages over APT language

6. Material handling systems in CAM
6.1. Material handling systems – functions in CAM environment – Primary and secondary systems – automated guided vehicle systems (AGVS)
6.2. AGV types – Towing vehicles – Unit load vehicles – Pallet trucks – Fork trucks – Light load vehicles – Assembly line vehicles – their applications
6.3. Robots – areas of application – types of robots
6.4. Layout of an industrial robot – functions of each component

7. Flexible manufacturing systems (FMS)
7.1. Different types of flexibilities – Machine flexibility – Production flexibility – Mix flexibility – Product flexibility – Routing flexibility – Volume flexibility – Expansion flexibility
7.2. Layout of a typical FMS showing principal components
7.3. Components of FMS – CNC machine centres –material handling equipment – Computer control – Human functions
7.4. Features of FMS – advantages – applications

8. Computer Integrated Manufacturing Systems (CIMS)
8.1. Components of a manufacturing system – Design functions module – Manufacturing functions module – Business functions module – Necessity of Integration
8.2. Concept of CIM– Benefits of CIM
8.3. Lean manufacturing – Introduction – steps involved – Benefits of lean manufacturing

REFERENCE BOOKS
1.Numerical Control and Computer Aided Manufacturing -T.K.Kundra,P.N.Rao -TMH
2.Computer Aided Manufacturing -T. K. Kundra,P.N.Rao -MGH Publishers
3 .CAD/CAM - Groover and Zimmers -Pearson Education India
4. Lean tools and 5 S Joe Bronski and fancesco lannelo -Kindle Edition

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Program Name: DIPLOMA Faculty Name:MD.RUKSAR SULTANA

Class	Semester	Name of the Subject	Subject Code	W.E.F
III DME	V	Computer Aided Drafting & CNC Laboratory	M-506	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
90 Hours	Theory	Practical 6	3	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

0 1. To impart the fundamental knowledge on using various analytical tools like AUTOCAD,ANSYS, FLUENT, etc., for Engineering Simulation.

1 2.To know various fields of engineering where these tools can be effectively used to improve the output of a product.

2 3. To impart knowledge on how these tools are used in Industries by solving some real time problems using these tools.

Course Outcomes:

CO1: Create CAD models using modeling software.

CO2: Create parts on CNC lathe / CNC X Mill.

COURSE CONTENTS

1) Study the Auto CAD screen, various toolbars and menus
a) Exercises on usage of Draw and modify tool bar.
b) Exercises on mirror, rotate, array and move commands
2) Exercises on dimension and hatching
3) a) Draw the knuckle joint full details & dimensioning
b) Draw the screw jack 2D drawing
4) Study the 3D solids (primitives) and solids tool bar options
5) a) Draw bolt and nut in 3D
b) Draw various parts of screw jack in assemble them as 3D component
6) Render the 3D images already generated and apply materials and light.
7) Study of CNC machine installed in the laboratory, identify the parts and know the function of parts
8) Use incremental system and absolute system on dimensioning.
9) Familiarization with G-codes and M-codes and part program writing
10) Simulation software practice using available softwares
11)a) Turning exercise step turning
b) Turning exercise using circular interpolation (CW/CCW)
c) Turning exercise taper turning
d) Turning exercise peck drilling
e) Turning exercise thread cutting
f) Turning exercise grooving with/without canned cycles using available CNC machine

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Program Name:DIPLOMA Faculty Name:B. HARI KUMAR

Class	Semester	Name of the Subject	Paper Code	W.E.F
III DME	V	NON CONVENTIONAL ENERGY SOURCES AND REFRIGERATION AND AIRCONDITIONING LAB	M-507	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
45 Hours	Theory	Practical 3	3	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1.To impart practical exposure to the student on the refrigeration and air conditioning equipment.

2.Student shall be able to refer various non conventional energy sources and their appliances.

Course Outcomes:

CO-1: Explain the components of vapour compression system.

CO2. Analyze the vapour compression cycle and interpret the usage of refrigerants.

CO3: Demonstrate the use of psychometric in analyzing refrigeration systems.

Course Content:

1. **C.O.P of Vapour Compression cycle test rig**

    1.1. State the scope of performance test on VCR test rig

    1.2. Identify the various components of test rig

    1.3. Draw the experimental lay out and basic cycle

    1.4. State the tool and equipment required

    1.5. State the observations to be made

    1.6. Understand the P-H diagram for given refrigerant

    1.7. Calculate the COP of test rig

2. **C.O.P of Domestic refrigerator**

    2.1. Identify the various components

    2.2. Draw the experimental layout

    2.3. State the observations to be made

    2.4. Understand the P-H diagram for given refrigerant

    2.5. Calculate the COP of test rig

3. **C.O.P of Water cooler test rig**

    3.1. Identify the various components

    3.2. Draw the experimental layout

    3.3. State the observations to be made

3.4. Understand the P-H diagram for given refrigerant

3.5. Calculate the COP of test rig

4. COP of Air Conditioning system

4.1. Identify the various components

4.2. Draw the experimental layout

4.3. Understand the process humidification and dehumidification

4.4. State the observations to be made

4.5. Understand the P-H diagram for given refrigerant

4.6. Calculate the COP of test rig

5. Vacuumization and Charging of refrigeration system

5.1. Know the reason for removal of air from refrigeration system

5.2. Evacuate the given system using vacuum pump

5.3. Apply leak tests before charging

5.4. State the need of correct amount of refrigerant for effective performance

5.5. Understand the procedure of charging

5.6. Check the quantity of fluid charged(By weight difference)

6. Servicing & Maintenance of R & AC Equipment

6.1. Prepare the maintenance schedule for domestic refrigeration system

6.2. Apply leak detection methods for refrigerant leaks

6.3. Familiarise the symptoms of faults in refrigerant system and their remedies.

7. Understand the working of solar radiation

8. Study of the following solar appliance

8.1. Solar heaters

8.2. Solar still

9. Study of the following wind mills

9.1. Horizontal axis wind mill

9.2. Vertical axis wind mill

10. Study wind measuring instruments

11. Study and performance of commonly used Bio gas plants

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Program Name: DIPLOMA Faculty Name:G.SIRISHA

Class	Semester	Name of the Subject	Subject Code	W.E.F
III DME	V	LIFE SKILLS	M-508	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
45 Hours	Theory	Practical 3	3	Internal 40	External 60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

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7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1. Understand concept of goal setting and time management skills.

2. Understand problem solving skills and leadership skills.

Course Outcomes:

CO1 : Understand the abilities time management self steam.

CO2: Understand and improve the teamwork spirit and stress management for practicing speaking.

Content

1.0 Understand the concept of Attitude
1.1 Define ‗Attitude'
1.2 Explain the importance of Attitude
1.3 Distinguish between Positive and Negative Attitudes
1.4 Life Response: Need for change of Attitude
1.5 Positive Attitude: Key to success in Personal and Professional Lives
2.0 Understand the concept of Adaptability
2.1 Define the term ‗Adaptability'
2.2 Explain the concept of Adaptability
2.3 Advantages of Adaptability
2.4 Disadvantages of Lack of Adaptability
2.5 Need for positive response to change
3.0 Understand the concept of Goal setting
3.1 Define the terms‗Goal' and ‗Goal Setting'
3.2 Explain the significance of Goal setting&Long and Short term goals
3.3 Explain the following concepts
a) Wish b) Dream c) Goal
3.4 Explain the reasons for and consequences of not setting goals
3.5 The SMART features in Goal setting
4.0 Understand the concept of Motivation
4.1 Define ‗Motivation' ; Inspiration Vs Motivation
4.2 Importance of motivation in Goal setting
4.3 Distinguish between Internal (Self) Motivation and External Motivation
4.4 De-motivating Factors and how to overcome them
4.5 Motivating oneself and others
5.0 Understand Time Management skills
5.1 Define ‗Time Management'.
5.2 Comprehend the significance of Time Management.
5.3 Explain the Time Quadrant
5.4 Common Time wasters and how to overcome them.
5.5 How to meet deadlines and targets within time
6.0 Understand Critical Thinking
6.1 Define—Critical Thinking‖,
6.2 Understand the importance of Critical Thinking
6.3 Distinguish between facts and opinions (assumptions)

6.4 Inculcating different perspectives
6.5 Developing Reasoning abilities and form sound judgments
7.0 Understand Creativity
7.1 Understand the importance of and need for creative ideas
7.2 Distinguish between Linear Thinking and Lateral Thinking
7.3 Distinctive qualities of creative people
7.4 Unusual or creative use of familiar objects
7.5 Creative ways of solving problems
8.0 Understand Problem Solving
8.1. Define the concept of Problem solving
8.2 Viewing the problems as challenges
8.3 Different steps in solving a problem
8.4 Selecting the best solution to solve a problem
8.5 Lateral thinking in Problem solving
9.0 Understand Team Work
9.1 Define Team work
9.2 Develop Team skills
9.3 Advantages of team work
9.4 Understand responsibilities as a team player
9.5 Problems of working in a team and possible solutions
10.0 Understand Leadership
10.1 Define Leadership
10.2 Identify Leadership qualities
10.3 Analyze one's strengths and limitations as a leader
10.4 Types of Leadership: Autocratic and Democratic
10.5 Leadership by example
11.0 Understand Stress Management
11.1 Define Stress
11.2 Explain the causes of stress
11.3 Learn Stress Management skills
11.4 Need for positive thinking and self esteem
11.5 Practice Stress Management skills

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POTTI SRIRAMULU CHALAVADI MALLIKARJUNARAO COLLEGE OF ENGINEERING & TECHNOLOGY

VIJAYAWADA - 520 001.

Approved by AICTE - ISO 9001:2015 Certified - Affiliated to JNTUK, Kakinada.

Program Name:DIPLOMA Faculty Name:B. HARI KUMAR

Class	Semester	Name of the Subject	Paper Code	W.E.F
III DME	V	WORKSHOP PRACTICE-III LAB	M-509	12/06/2018

SYLLABUS

Total No.of Hours for Teaching-Learning	Instructional Hours for Week		Duration of semester End Examination in Hours	Max Marks	
	Theory	Practical		Internal	External
60 Hours		4	3	40	60

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve engineering problems.

4. Engineering Tools: Apply appropriate technologies and tools with an understanding of the

limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering practice.

6. Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. Communication: An ability to communicate effectively.

10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1.The students are required to understand the parts of various machine tools and operate them.

2.The students are required to understand the different shapes of products that can be produced on these machine tools.

Course Outcomes:

CO-1: The students can operate different machine tools with understanding of work holders and operating principles to produce different part features to the desired quality.

CO2. The students can operate different machine tools with understanding of work holders and operating principles to produce different part features to the desired quality.

Course Content:

1. **Milling**

   T-slot cutting on milling machine.

   Spur gear

   Helical gear cutting on milling machine

2. **Slotting**

   Key way cutting by slotting machine.

   Indexing method in slotting machine

3. **Planning**

   Preparation of plain surface with planning machine

4. **Grinding**

   Preparation of rectangular block of precise dimensions by using surface grinding machine.

   Sharpening of lathe tools, milling cutter and drill bit by using tool and cutter grinder.

5. **Metrology**

   Linear measurement by slip gauges

   Angular measurement by Sine bar

   Gear Tooth Measurement using Gear Tooth Caliper

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Program Name: **DIPLOMA** **Faculty Name:**
S.G.S.PRIYANKA

Class	Semester	Name of the training	Duration	W.E.F
III	VI	INDUSTRIAL TRAINING	6months	14/11 /18

RULES AND REGULATIONS:
1. A candidate shall be assessed twice in the spell of industrial training i.e. at the end of third month and finally before he/she completes the industrial training
2. A candidate shall be assessed twice during the mid spell of industrial training and at the end of industrial training.
3. The assessment shall be carried out by a committee comprising of
(a) A representative of the Industry where the candidate is undergoing training
(b) A staff member of the concerned section of the polytechnic.
4. Each assessment should be as per the Assessment scheme listed

Programme Outcomes:

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to

solve the engineering problems.

2. Discipline knowledge: An ability to apply discipline - specific knowledge to solve core and/or

applied engineering problems.

3. Experiments and practice: An ability to plan and perform experiments and practices and to use

the results to solve engineering problems.

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limitations.

5. The engineer and society: Demonstrate knowledge to assess societal, health, safety, legal and

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and environmental contexts, and demonstrate the knowledge and need for sustainable development.

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Programme Specific Outcomes:

PSO 1: The Mechanical Engineering Diploma Students acquire technical and managerial skill that make them an employable graduate.

PSO 2: The Mechanical Engineering Diploma Students acquire theoretical background of each course that they are capable of applying it for solving real-time (Physical) problems.

Course Objectives:

1. Students able to expose to the core and working environment in order to improve their practical skills.
2. To develop communication and managerial skills by themselves to the modern world.

Course Outcomes:

On completion of a spell of practical training in a industry, the student will be able to

Know the organizational set up from top executive to workmen level

Know the function of each department/section

Know the inter relationship among various department/sections

Know the various raw materials used as feed stock and their source.

Understand the various intermediates produced and their further processing and / or waste disposal.

Know the final products, its composition and its commercial importance's, uses and applications.

Understand the various stages involved in processing, sequential arrangement of different equipment.

Draw the flow diagram, detail flow diagram of each process

Understand the arrangement of various equipment and machinery in systematic manner in a less possible area of site.

Know the various analytical methods used in the quality control department

Understand the experimental methods to find out the quality of the product

Understand various tools, instruments used for quality checking.

Know the trouble shooting in process operation

Know preventive precautions of each equipment in the plant.

Startup and shut down procedures for the equipment and plant.

Know the importance of safety in industries

Understand the safety about personnel protection, equipment protection

Know the usage of various safety devices

Precautionary measures to be taken.

Know the various pollutants emitted from the plant.

Understand effects of pollutants.

Understand treatment method and disposal.

Know the effective methods pollution control.

COURSE CONTENTS

1. Organizational set up
2. Raw materials, intermediates and end products
3. Process descriptions (Process flow diagrams and line tracing, detailed flow diagrams etc.)
4. Quality control of raw materials, intermediates and end products
5. Operational troubles and preventive measures
6. Safety aspects (personnel, equipment etc.)
7. Pollution control

ASSESSMENT SCHEME

S. No.	Name of the Parameter	Max. Marks Allotted for each Parameter
1.	Attendance and punctuality	10
2.	General conduct during the period	10
3.	Ability to communicate & human relations	10
4.	Familiarity with materials, tools & machinery	10
5.	Attitude towards job	10
6.	Manual skills	10
7.	Comprehension & Observation	10
8.	Supervising ability	10
9.	Safety and Environmental consciousness	10
10.	Maintenance of dairy	10
	Total:	**100**

1. The remaining <u>100 marks</u> are to be allotted as follows: For maintenance of log book 30 marks

For the training report 30 marks,

For seminar / viva-voce 40 marks.

The assessment at the institute level (seminar / viva-voce) is to be done by the following three members individually and be averaged.

(1) Head of Section.
(2) External Examiner preferably from Industry
(3) Staff member who assessed the student during the Industrial Training.

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