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.

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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:

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.

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**:

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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.

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:

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.

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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:

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.

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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.

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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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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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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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)=-∂B/∂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.

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
48 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.

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

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
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. 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.

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.

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.

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.

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
48 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.

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

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.

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]:

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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.

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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.

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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.

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
48 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.

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   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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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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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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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.

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.
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.

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
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 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.

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.

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 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
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.
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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.

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.

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
60 Hours	Theory 5	Practical ---	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, 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.

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.
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Program Specific Outcomes [PSOs]:

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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.

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
60 Hours	Theory 5	Practical ----	3	Internal 30	External 70	3

Programme Outcomes:

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

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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.