19EET01: BASIC ELECTRICAL ENGINEERING

(Common for CSE, ME & ECE Branches)

Course Outcomes:

After completion of the course the student will able to

CO1: Apply the concepts of basic laws and calculate the fundamental quantities in DC circuits.

CO2: Describe the basic concepts of electromagnetism, types of induced emf, self and mutual Inductances.

CO3: Understand the basic definitions, Analyze and apply the phasor algebra approach in R, L, C series and parallel AC circuits.

CO4: Apply the various Network theorems to determine circuit response

CO5: Describe the principle of operation, Types and construction of DC generators, DC motors,

CO6: Describe the principle of operation of Transformers, Single & three phase induction motors.

19EET02: CIRCUITS AND NETWORKS-I

Course Outcomes:

After completion of the course the student will able to

CO1: To understand various basic definitions and concepts.

CO2: To calculate the equivalent impedance by using network reduction techniques and determine the current through any element and voltage across any element.

CO3: To understand the concepts of AC circuits and determine the real power, reactive power, power factor etc.

CO4: To analyze the series ,parallel resonant circuit and locus diagrams.

CO5: To apply theorems for finding the solutions of network problems.

CO6: To explain the concepts of Network Topology and Coupled circuits.

19BST03: CIRCUITS AND NETWORKS – II

Course Outcomes:

After completion of the course the student will able to

CO1: Explain the analysis of three phase balanced and unbalanced circuits and to measure Active and reactive powers in three phase circuits

CO2: Analyze the transient response of R-L, R-C, R-L-C series circuits for d.c and a.c Excitations

CO3: Understand about the network functions and Laplace transforms for circuit analysis

CO4: evaluate two-port network parameters

CO5: Synthesize one port network using Foster and Cauer Forms.

19EET10: CONTROL SYSTEMS

Course Outcomes:

On successful completion of the course, students will be able to

CO1. Demonstrate knowledge on the concepts of open and closed loop control systems.

CO2. Understand the Concepts of stability analysis in Time Domain.

CO3. Analyze the Stability analysis in Frequency Domain.

CO4. Explore about different types of controllers.
CO5.Develop and analyze state space models.

19EET04: ELECTRICAL MACHINES-I

Course Outcomes:
Students will be able to:
CO 1: Understanding principles of DC machines, SEMS and MEMS.
CO 2: Application of knowledge to solve problems relating DC machines or Transformers.
CO 3: Analysing and comparing systems and their components/factors.
CO 4: Attempt experiments relating to DC and AC machine using laboratory equipment.
CO 5: Work in a team to build laboratory project.

19EET07: ELECTRICAL MACHINES-II

Course Outcomes:
After completion of the course the student will able to
CO1: Understanding principles of AC Machines
CO2: Application of Knowledge to solve problems relating AC Machines
CO3: Analyzing and comparing systems and their components/factors
CO4: Attempt experiments relating to AC Machine using Laboratory equipment
CO5: work in team to build laboratory project

19EET06: POWER SYSTEMS –I

Course Outcomes:
After completion of the course the student will able to
CO1: Have an understanding on basic transmission line parameters.
CO2: Ability to determine design parameters required for Distribution systems.
CO3: Analyze the operation of underground cables.
CO4: Formulate the Transmission line sag Tension, corona.
CO5: Application of Knowledge on Economic Aspects.

19EET34: NETWORK THEORY

Course Outcomes:
After completion of the course the student will able to
CO1: Analyze the series, parallel resonant circuit and locus diagrams
CO2: Analyze the transient response of R-L, R-C, R-L-C series circuits for d.c and a.c Excitations
CO3: Understand about the network functions and Laplace transforms for circuit analysis
CO4: evaluate two-port network parameters
CO5: Analyze about filters and its applications.

19EET08: GENERATION OF ELECTRIC POWER

Course Outcomes:

After completion of the course the student will able to

CO1: Understand the Layout of various generating power stations.
CO2: Design Electrical layout of various generating stations.
CO3: Ability to discuss about various power sources for generation of power merit/Demerit.
CO4: Describe about various methods of production and to classify the electrical energy from Economic point of view.
CO5: Discuss the energy resources and energy conversion methods available for the production Of electric power in India.

19EEP02: CIRCUITS AND NETWORKS – I LABORATORY

Course Outcomes:

After completion of the course the student will able to

CO1: Apply suitable theorems for circuit analysis and verify the results theoretically.
CO2: Experimentally determine self inductance, mutual inductance and coefficient of coupling
CO3: Calculate Resonant Frequency, Bandwidth, Quality factor for a series and parallel RLC Circuit.
CO4: Verify KVL and KCL in a series and parallel resistive network.
CO5: To draw current locus diagrams

19EEP04: CIRCUITS AND NETWORKS – II LABORATORY.

Course Outcomes:

After completion of the course the student will able to

CO1: Interpret system functions through transient response of series RL and RC circuits
CO2: Analyze the concepts of impedance and admittance parameters of a two port network
CO3: Determination of Hybrid parameters, transmission of a two port network.
CO4: Calculate impedance and admittance of two port network
CO5: Find the reactive and 3 phase power by using two wattmeter.

19EEP01: BASIC ELECTRICAL ENGINEERING LABORATORY

Course Outcomes:

After completion of the course the student will able to

CO1: Apply suitable theorems for circuit analysis and verify the results theoretically.
CO2: Experimentally determine self inductance, mutual inductance and coefficient of coupling
CO3: Analyze the performance of DC shunt motor, single phase transformer.
CO4: Verify KVL and KCL in a series and parallel resistive network.
CO5: To draw current locus diagrams

EEP02 - ELECTRICAL MACHINES-I LABORATORY

Course Outcomes:

After completion of the course the student will able to

Course Outcomes: At the end of lab course, student will able to

CO 1: Determine the performance of a single phase transformer by conducting Open Circuit (O.C) and Short Circuit (SC) tests and Sumpner's test.

CO 2: Understand 3-phase to 2-phase transformation using the Scott connection and determine the Different losses of the transformers.

CO 3: Determine the performance characteristics of DC shunt and DC compound generators by Conducting load tests.

CO 4: Implement the speed control techniques for a separately excited DC motor

CO 5: Determine the performance characteristics of DC machine by conducting direct and indirect tests.

EEP03-ELECTRICAL MACHINES-II LABORATORY

.**Course Outcomes:**

After completion of the course the student will able to

CO1: IdentifyrelevantinformationtosupplementtotheElectricMachines-IIcourse.

CO2: Set up testing strategies and select proper instruments to evaluate performance characteristics Of electrical machines.

CO3: Analyze the machines operation under different loading conditions.

CO4:.Prepare professional quality textual and graphical presentations of laboratory data and Computational results.

CO5:Primarilyviateam-based laboratory activities, students will demonstrate the ability to interact Effectively on a social and interpersonal level

19EET09: POWER SYSTEMS-II

Course out comes:

On successful completion of the course, students will be able to

CO1:.Have Knowledge on Performance of short, medium & long transmission lines.

CO2:Do calculation of power system Transients.

CO3: Explain methods for economic load dispatch and unit commitment.

CO4: Design the mathematical models of the mechanical and electrical components involved in the operation of power systems with the voltage and frequency control of single area or interconnected multi area power systems.

CO5: Expound the methods for active and reactive power control.

19EET05: ELECTROMAGNETIC FIELDS

Course Outcomes:

After completion of this course the student will be able to:

CO1: Understand vector algebra, 3-dimensional co-ordinate systems and static electric fields due to electric Charges.

CO2: Acquire knowledge on basic principles, concepts and use of fundamental laws to find

Fields and Potentials for a variety of situations including charge distributions and Capacitors and to Calculate and design capacitance, energy stored in dielectrics.

CO3: Explain fundamental laws governing electromagnetic fields and evaluate the physical Quantities of Electromagnetic fields (Field intensity, Flux density etc.) in different Media using the fundamental laws.

CO4: Determine the behaviour of magnetic fields in the presence of dielectric and magnetic Materials and Describe/analyze the force and inductance of magnetic fields

CO5: Derive electromagnetic wave equations and analyze Maxwell's equations for both time Variant and time invariant electric and magnetic fields

19EET13: POWER ELECTRONICS

Course outcomes:

At the end of the course the student will be able to

CO1: Describe the characteristics of various power semiconductor devices and analyze The Static and dynamic characteristics of SCR's and Design firing circuits for SCR

CO2: Understand the operation of single phase and three phase converters.

CO3: Analyze the operation of different types of DC-DC converters and control Strategies.

CO4: Explain the operation of single and three phase inverters and application of PWM techniques for voltage Control.

CO5: Discuss about the operation of AC voltage controllers and Cyclo converters.

19EET12: ELECTRICAL&ELECTRONICS MEASUREMENTS

Course Outcomes:

CO1: The basic principles of different types of electrical instruments for the Measurement of Voltage, current, Resistance, Extend the range **of ammeters and voltmeters and** Analyse the Errors in them.

CO2: Develop an ability to use DC bridges for measurement of Resistance, Inductance and Capacitance, and also use Potentiometers.

CO3: Develop an ability to use AC bridges for measurement and the use of Current Transformers& Potential Transformers.

CO4: Use Watt-meters, pf meters, Synchroscopes, Ratiometers and energy meters in a given Circuit.

CO5: Understand the working knowledge of electronic instruments and display devices and Analyze the different characteristic features of periodic and aperiodic signals using CRO.

19EET11: POWERSYSTEM ANALYSIS

Course Outcomes:

At the end of the course the student will be able to:

CO1: Design mathematical models for power system components

CO2: Determine the fault currents for symmetrical and unbalanced faults

CO3: Generate input data suitable for load flow, fault calculations and state estimation.

CO4: Able to analyze the steady state, transient and dynamic stability concepts of a power

System

CO5: Swing equation and its solution, Equal area criterion and its applications

EEP02 – POWER SYSTEMS LABORATORY

Course Outcomes:

After completion of the course the student will able to

Course Outcomes: At the end of lab course, student will able to

CO 1: Determine the performance of a single phase transformer by conducting Open Circuit (O.C) and Short Circuit (SC) tests and Sumpner's test.

CO 2: Understand 3-phase to 2-phase transformation using the Scott connection and determine the Different losses of the transformers.

CO 3: Determine the performance characteristics of DC shunt and DC compound generators by Conducting load tests.

CO 4: Implement the speed control techniques for a separately excited DC motor

CO 5: Determine the performance characteristics of DC machine by conducting direct and indirect tests.

19EET16: POWER QUALITY & FACTS

Course Outcomes:

After completion of the course the student will able to

CO1: Describe the power quality issues.

CO2: Analyze the voltage disturbances and suggest suitable mitigating techniques.

CO3: Understand the working principles of FACTS devices and their operating characteristics

CO4: estimate the effect of shunt and series reactive compensation.

CO5: Apply the concepts in solving problems of simple power systems with FACTS controllers

19EEENERGY AUDITING & DEMAND SIDE MANAGEMENT

Course Outcomes:

After completion of the course the student will able to

CO1: Explore the current energy scenario and importance of energy conservation.

CO2: Illustrate the methods of improving energy efficient motors.

CO3: Analyze the methods of improving power factor.

CO4: Understand the concepts of different energy efficient devices.

CO5: Impart knowledge on Energy Economic analysis and Demand side management.

19EET22: POWER SYSTEM DYNAMICS AND CONTROL

Course Outcomes:

At the end of this course, students will able to

CO1: Understand the problem of power system stability and its impact on the system.

CO2: Impart Knowledge on linear dynamical systems Analysis and use of numerical Integration methods.

CO3: Create Mathematical modelling for Synchronous machines and Associated controllers for the study of stability.

CO4: Model the power system components for the study of stability.

CO5: Analyse the methods to improve stability.

19EET29: CONTROL SYSTEMS DESIGN

Course Outcomes:

At the end of this course, students will be able to

CO1: understand various design specifications.

CO2: Analyse the Concepts of compensator in time and frequency domain

CO3: Describe the Concepts of compensator in time and frequency domain

CO4: Design controllers to satisfy the desired design specifications using simple controller Structures (P, PI, PID, compensators).

CO5. Intend the controllers using state-space approach.

19EET18: DIGITAL CONTROL SYSTEMS

Course Outcomes:

At the end of this course, students will be able to

CO1: Obtain discrete representation of LTI systems.

CO2: Acquire knowledge on Z-Transforms in discrete time analysis.

CO3: Analyze stability of open loop and closed loop discrete-time systems.

CO4: Describe and analyze digital controllers.

CO5: Design state feedback and output feedback controllers.

19EET19: SPECIAL MACHINES

Course outcomes:

At the end of this course, students will able to

CO1: Explain the theory of travelling magnetic field and applications of linear motors.

CO2: Understand the basic theories of stepper motors.

CO3: Analyze the performance and control of stepper motors, and their applications

CO4: Get knowledge on Brushless DC motor and Permanent magnet motor performance

CO5: Discuss the Switched mode reluctance motor operation and characteristics.

19EET31: HIGH VOLTAGE DIRECT CURRENT TRANSMISSION

Course Outcomes:

At the end of this course, students will be able to

CO1: Compare dc transmission over ac transmission.

CO2: Describe the operation of Line Commutated Converters and Voltage Source Converters.

CO3: Explain the control strategies used in HVDC transmission system and understand the Improvement of power system stability using an HVDC system

CO4: Understand the occurrence of faults, and transients in HVDC system and their protection.

CO5: Device means to suppress / eliminate harmonics and Design HVDC Filters.

19EET20: NEURAL NETWORKS AND FUZZY LOGIC

Course Outcomes:

At the end of this course, students will be able to

CO1: Discuss the concepts of Artificial Neural networks

CO2: Acquire the adequate knowledge about feedback networks.

CO3: Explain the learning rules and control applications of Neural Networks.
CO4: Understand the concept of fuzziness, fuzzy set theory and gain the comprehensive Knowledge of fuzzy logic control and adaptive fuzzy logic
CO5: Design of fuzzy systems for real time applications.

19EET26:INDUSTRIAL ELECTRICAL SYSTEMS

Course Outcomes:

At the end of the course the student will be able to

CO1: Know the tariff structure and various protection components
CO2: Design aspects of lightning and sizing of wiring systems
CO3: Estimate the illumination levels produced by various sources and to design different Lighting systems by taking inputs and constraints in view
CO4: calculate different compensation techniques and lightning protection
CO5: Know the functioning and applications of DG systems, UPS and Battery banks

19EET30: PROGRAMMABLE LOGIC CONTROLLER AND ITS APPLICATIONS

Course Outcomes:

At the end of the course the student will be able to

CO1: Know the architecture, connecting devices and programming of PLC
CO2: design logic circuits to perform industrial control functions of medium complexity
CO3: demonstrate the correct operation of logic circuits by programming them into the Programmable logic controller.
CO4: develop coded programs for the programmable logic controller.
C05: use the programmable controller for troubleshooting

19EET14: RENEWABLE ENERGY SOURCES

Course Outcomes:

At the end of this course, students will demonstrate the ability to

CO1: Understand the energy scenario and the consequent growth of the power generation From renewable energy sources.
CO2: Understand the basic physics of solar power generation and the performance Characteristics.
CO3: Understand the methods of Solar power Storage and understand the applications of Solar Energy.
CO4: Understand the basic physics of Biomass power generation and the performance analysis And Testing
CO5: Understand the basic physics of Wind power generation and the performance analysis and Control strategies.

19EET32: MODERN CONTROL THEORY

Course Outcomes:

At the end of this course, students will able to

CO1: Design of pole assignment and observer using state feedback.

CO2: Identify and analyze non-linear systems using describing function analysis
CO3: Analyze linear and non-linear systems using Lyapunov function and design Lyapunov function for Stable systems
CO4: Formulate an optimal control problem and design optimal control signal.
CO5: Generate state space models for dynamic systems.

19EET15: ELECTRICAL MACHINE DESIGN

Course Outcomes:
At the end of this course, students will demonstrate the ability to
CO1: Explain the construction and performance characteristics of electrical machines.

CO2: Describe the various factors which influence the design: electrical, magnetic and thermal Loading Of electrical machines
CO3: Understand the principles of electrical machine design and carry out a basic design of an ac machine. Use software tools to do design calculations.
CO4: Get Knowledge on approach the problem linked to design of electrical machines.
CO5: Ability to analyze the heating and cooling of electrical machines.

19EET24: HIGH VOLTAGE ENGINEERING

Course Outcomes:
After completion of the course the student will able to
CO1: Discuss about the basic physics related to various breakdown processes in solid, Liquid and gaseous insulating materials.
CO2: Explain the basic concepts of generation and measurement of D. C., A.C., & Impulse Voltages.
CO3: Perform test on H. V. equipment and on insulating materials, as per the standards.
CO4: Describe how over-voltages arise in a power system, and protection against these over-Voltages.
CO5: Analyse the breakdown of HV insulation (solid, liquid & gas).

19EET27: ELECTRICAL DISTRIBUTION SYSTEMS

Course Outcomes:
At the end of this course, students will be able to
CO1: Understand the necessity of distribution system planning.Necessity of planning of Sub-transmission, distribution substations for future load requirements and different substation schemes.
CO2: Design considerations of primary & secondary systems.
CO3: Explain the co-ordination of protective devices in distribution system.
CO4: Application of capacitors to distribution systems.
CO5: Illustrate the voltage control and how to achieve it.

19EET34: UTILIZATION OF ELECTRICAL ENERGY

Course Outcomes:
On completion of this course the student shall able be
CO1: maintain electric drives used in an industries
CO2: Identify a heating/ welding scheme for a given application
CO3: Describe how to use Trouble shoot various lamps and fittings.
CO4: Design the different schemes of traction schemes and its main components
CO5: Explain the suitable scheme of speed control for the traction systems

19EET13: SWITCH GEAR AND PROTECTION

Course Outcomes:
CO1: To Judge the operation of different Types of Protective Relays.
CO2: Get thorough knowledge on different relays which are used in real time power system Operation.
CO3: To explore the protection of different power system components such as generators, Transformers, lines and feeders against over voltages.
CO4: Analyse the operation of different Types of Circuit Breakers.
CO5: Understand the protection of different power system components such as generators, Transformers, lines and feeders against over voltages.

19EET23: ELECTRICAL DRIVES

Course Outcomes:
At the end of this course, students will demonstrate the ability to
CO1: Judge the operation of Different types of Electrical Drives
CO2: Describe about the speed control of DC Motor by using PE Equipment
CO3: Explain about various types of operation of DC drive
CO4: Analyse the operation of Current Controller and Speed Controller
CO5: Illustrate the performance of Induction Motor by using VSI

19EET28: ADVANCED ELECTRIC DRIVES

Course Outcomes:
At the end of this course, students will demonstrate the ability to
CO1: Understand the definitions, scope, objectives in Advanced Electrical Drives.
CO2: Illustrate on induction motor drives.
CO3: Implement the PWM technique.
CO4: Explain the speed control of BLDC, PMSM.
CO5: Judge the performance SRM

19EET25: SMART ELECTRICAL GRIDS

Course Outcomes:

At the end of this course, students will demonstrate the ability to

CO1: understand the challenging issues and architecture of smart grid.

CO2: Explain the communication and wide area monitoring in smart grid.

CO3: analyse rudimentary management issues in smart grid.

CO4: acquire the knowledge in computational intelligence and security issues in smart grids.

CO5: Describe the role of power electronics and energy storage in smart grid.