

Course Outcomes (CO) - Department of Electrical Engineering

Course Outcomes are narrower statements that describe what students are expected to know, and be able to do at the end of each course/subject. While the POs define the departmental outcomes, the COs are more oriented towards the subjects and are mostly defined by the faculties consulting higher authorities. The COs are more like statements that relate to the skills, knowledge, and behavior the students acquire as they go through a specific course within a program. They collectively contribute to the program outcomes. They are to be mapped to the POs, and not necessarily to a single one.

Course Outcomes from Semester 3 onwards are mentioned below

II Year/ III Semester

3EE4-01: Electrical Circuit Analysis-I

Course Outcomes:

Upon successful completion of the course, the students will be able to:

CO-1: Construct a circuit to suit the need and apply Nodal and Mesh methods to analyze the circuit.

CO-2: Learn the importance of circuit and networks and its applications in Electrical Engineering using theorems.

CO-3: Apply linearity/superposition concepts to analyze RL, RC and RLC circuits in time and frequency domains.

CO-4: Understand the concept of Laplace Transform and its application for the transient analysis of the circuits.

3EE4-02: Electrical Machines-I

Course Outcomes:

Upon successful completion of the course, the students will be able to:

CO-1: Understand the magnetic circuits and basic principle of energy conversion.

CO-2: Learn the basic principles of DC machine and transformers.

CO-3: Evaluate performance characteristics of the DC machine and transformer.

CO-4: Know the basic working of single phase as well as poly phase Transformer

3EE4-03: Electrical Measurements

Course Outcomes:

Upon successful completion of the course, the students will be able to:

CO-1: Understand the common electrical measuring instruments and their use in field.

CO-2: Learn about the instrument transformers for the measurement of high voltage and current

along with the testing of CTs and PTs.

CO-3: Know the categories of various resistances and their measurement techniques along with the potentiometer.

CO-4: Understand the concept AC bridges for the measurement of electrical circuit parameters.

3EE4-04: Analog Electronics

Course Outcomes:

Upon successful completion of the course, the students will be able to:

- CO-1: To analyze PN junctions in semiconductor devices under various conditions.
CO-2: To Design and analyze various diodes and its applications.
CO-3: To understand BJT and FET configurations.
CO-4: To design and analyze BJT and FET amplifiers.

3EE4-05: Power System Instrumentation

Course Outcomes:

Upon successful completion of the course, the students will be able to:

- CO-1: Understand the various types of errors in instruments.
CO-2: Learn about the sensors and transducers for the measurement of temperature, pressure, displacement, acceleration and noise level.
CO-3: Know the amplifiers, multipliers, dividers, function generators, timers, sample-and-hold, isolators, shielding and grounding.
CO-4: Understand the instrumentation in the power plants and computer based modern schemes for operation, maintenance and protection of power systems.

3EE3-06: Advanced Engineering Mathematics-I

Course Outcomes:

Upon successful completion of the course, the students will be able to:

- CO-1: To study the numerical interpolations for equal and unequal intervals, numerical differentiation, integration and solving ordinary differential equations by numerical methods.
CO-2: To study the solution of polynomials, algebraic and transcendental by numerical methods including linear equations.
CO-3: Compute the discrete and continuous random variables, probability distributions, expectations, moments, MGF, mean and variances.
CO-4: Define and explain the different statistical distributions like Binomial, Poisson, Normal, Uniform, and Exponential distributions and compute the method of least squares, correlation and regression.
CO-5: To study the theory of partial differential equations by using the separation of variables.
CO-6: To study and understand the Fourier series, half range Fourier sine and cosine series.

3EE4-20: Electrical Machines Lab-I

Course Outcomes:

Upon successful completion of the course, the students will be able to:

- CO-1: Obtain the characteristics of the separately-excited DC shunt generator.
CO-2: Perform the speed control of DC shunt motor.
CO-3: Determine the efficiency of DC shunt machine by performing Swinburne's test in practice.
CO-4: Know the Sumpner's test on two identical 1-phase transformers for finding the efficiency.

3EE4-21: Electrical Measurement and Instrumentation Lab

Course Outcomes:

Upon successful completion of the course, the students will be able to:

- CO-1: Operate and take the measurements from CRO, DSO and various other meters.
CO-2: Measure the active power, reactive power and power factor of three-phase load using two-wattmeter and one-wattmeter method.
CO-3: Operate the Crompton's Potentiometer and DC slide wire potentiometer for the measurement of low resistance, unknown EMF and calibration of voltmeter and ammeter.
CO-4: Perform the experiments on Kelvin's double bridge and Anderson's bridge.

CO-5: Know about the real time use of LVDT and Strain Gauge.

3EE4-22: Analog Electronics Lab

Course Outcomes:

Upon successful completion of the course, the students will be able to:

CO-1: Understand the working of CRO, multimeter, Signal generators & power supply.

Co-2: Analyze diodes, their characteristics and circuits.

CO-2: Analyze the transistor circuits and their characteristics.

CO-3: Application of diodes and transistors, working on mini projects.

3EE4-23: Electrical Circuit Lab

Course Outcomes:

Upon successful completion of the course, the students will be able to:

CO-1: Use the tools of Soldering - Desoldering process.

CO-2: Simulate a circuit to verify the superposition theorem and observe the voltages and currents at the various nodes and branches of the circuit respectively.

CO-3: See the characteristic of BJT and SCR through simulation and hands on bread board or PCB.

CO-4: Simulate the speed control of DC motor, Battery Voltage Level Indicator Circuit, RC and RL circuits.

II Year/ IV Semester

4EE4-01: Electrical Machines-II

Course Outcomes:

Upon successful completion of the course, the students will be able to:

CO-1: Understand the fundamental of the AC machines.

CO-2: Understand the working and characteristics of poly phase induction machine.

CO-3: Learn about the working and characteristics of single-phase induction motor and special machines.

CO-4: Understand the working and characteristics of alternator and synchronous motor.

4EE4-02: Generation of Electrical Power

Course Outcomes:

Upon successful completion of the course, the students will be able to:

CO-1: Know the basic operation of conventional power plants, especially, Thermal, Hydro, Gas and Nuclear Power Plants.

CO-2: Understand the working of wind, tidal and solar PV systems.

CO-3: Learn about the various factors associated with the power plants & loads and tariffs.

CO-4: Understand the economics of power plants and power factor improvement.

4EE4-03: Electrical Circuit Analysis-II

Course Outcomes:

Upon successful completion of the course, the students will be able to:

CO-1: Understand the concept of Fourier Series for sinusoidal and non-sinusoidal waveforms and

its application for the circuits.

CO-2: Analyze the transfer impedance and admittance and learn the physical significance of

poles

and zeros for the circuits.

CO-3: Know about the two-port models and parameters to simplify large circuits.

CO-4: Synthesize the immittance networks and construct filters to eliminate the unwanted signals from the circuits.

4EE4-04: Electrical Machine Design

Course Outcomes:

Upon successful completion of the course, the students will be able to:

CO-1: Understand the fundamentals of the various design parameters along with the electrical engineering material.

CO-2: Design the heating and cooling arrangement for the electrical machines.

CO-3: Design the core and winding of the power and distribution transformers as per the given requirements.

CO-4: Design synchronous and induction machines as per the given requirements.

4EE4-05: Computer Programming

Course Objectives:

1. To understand the basic concepts of data structures and algorithms.

2. To understand the basic concepts of object-oriented programming.

3. To differentiate linear and non-linear data structures and the operations upon them.

4. Ability to perform sorting and searching in a given set of data items.

5. To comprehend the necessity of time complexity in algorithms.

6. Ability to apply concept of abstraction, inheritance, polymorphism and operator overloading.

4EE3-06: Advanced Engineering Mathematics-II

Course Outcomes:

Upon successful completion of the course, the students will be able to:

CO-1: To understand the concepts and to solve the problems of Laplace transform along with their properties and applications to ODE and PDE.

CO-2: To understand the concepts and to solve the problems of Fourier transform along with their properties.

CO-3: To study and understand the concepts of Z- transform along with their properties.

CO-4: To study the techniques of complex variables together with other concepts and properties of an analytic function, complex integration, classification of singularities, calculus of residues and evaluation of integrals.

4EE4-20: Electrical Machines Lab-II

Course Outcomes:

Upon successful completion of the course, the students will be able to:

CO-1: Operate and test the 3-phase induction motor to find its characteristics and efficiency at the different load settings.

CO-2: Connect two 3-phase induction motor in cascade and study their speed control.

CO-3: Run an alternator to find its OCC & SCC characteristics and voltage regulation.

- CO-4: Perform an experiment on synchronous motor to obtain its V-curve.
CO-5: Synchronize an alternator across the infinite bus and control load sharing.

4EE4-21: Power System Design Lab

Course Outcomes:

Upon successful completion of the course, the students will be able to:

- CO-1: Design the basic schemes of hydro, thermal, nuclear and gas power plants.
CO-2: Design feeders, distributors and auxiliary power supply schemes.
CO-3: Forecasting the load in short term, medium term and long-term.
CO-4: Design CT and PT for measurement of voltage and current at sub stations.

4EE4-22: Computer Programming Lab

Course Outcomes:

Upon successful completion of the course, the students will be able to:

- CO-1: Be able to design and analyze the time and space efficiency of the data structure.
CO-2: Understand the concept of static & Dynamic memory management
CO-3: Be capable to identify the appropriate data structure for given problem.
CO-4: Have practical knowledge on the applications of data structures.
CO-5: Understanding of the basic concept of object-oriented programming.
CO-6: Application of abstraction, Inheritance, Polymorphism and function and operator overloading.

4EE4-23: Electrical Machine Design Lab

Course Outcomes:

Upon successful completion of the course, the students will be able to:

- CO-1: Design the core and windings of a transformer considering minimum cost and minimum losses.
CO-2: Design DC machines and SC machines considering specified parameters.
CO-3: Design of 3-phase induction motor and 1-phase capacitor start induction motor.
CO-4: Design a 3-phase turbo alternator and synchronous generator.