

<b>Course Code and Name</b>	<b>Course Outcomes (COs)</b>
<b>(UEE101) Electrical Science</b>	To compute reliably the performance of DC networks and distinguish various supply systems.
	To represent AC quantities through phasors and compute AC system behavior during steady state.
	To comprehend magnetic circuits analysis and energy conversion principles for different electric systems.
	To realize the importance of transformer in AC systems and calculate the voltage regulation and efficiency of transformers
	To compare the characteristics and operational aspects of various electric motors and shall choose as per the application
	To observe and conform the electric safety aspect and conservation efforts
<b>(UEI403) Electrical and Electronic Measurements</b>	To distinguish various electromechanical indicating instruments and their use.
	To describe the role of instrument transformers and analyze their performance
	To explain the working and application of electronic instruments such as CRO, spectrum analyzer etc.
	To apply AC and DC bridges for various measurements
<b>(UEI201) Analog Electronic Devices and Circuits</b>	To demonstrate the construction and working of electronic devices such as diodes, BJT, FET
	To analyze the characteristics of different type of electronic devices such as diodes, BJT, FET.
	To design circuits such as rectifiers, clippers, clampers, filters etc.
	To design power supplies and solve problems related to amplifiers and oscillators.
<b>(UEE301) Direct Current Machines and Transformers</b>	To test the transformer and calculate its efficiency and performance in distribution system.
	To scrutinize three-phase transformer connections and use special purpose transformer for measurement and protection.
	To select appropriate DC motor for specific purpose and can compute their steady performance.
	To compute the performance with DC generators and can supply increasing load with parallel operation
	To select the speed control and starting method of DC motor
<b>(UEE302) Electromagnetic Field Theory</b>	To calculate electric and magnetic fields in different coordinates for various charge and current configurations
	To demonstrate different aspects of plane wave in dielectric and conducting media
	To realize the analogy of wave with transmission line and calculate the transmission line performance
	To select the appropriate guide for electromagnetic waves
	To explain India's power scenario, power system structure, and related issues.

<b>(UEE303) Power Generation and Associated Economics</b>	To harness power from conventional and renewable sources.
	To select the methods and size of plant generating power for overall economy.
	To decide the tariff structure for different type of users.
<b>(UEI303) Techniques on Signals and Systems</b>	To explain the basics of signals and systems
	To solve different type of problems related to Fourier series and Fourier transforms.
	To use Laplace transforms and Fourier transforms for different applications.
	To describe the concept of random signals
<b>(UEE401) Alternating Current Machines</b>	To analyze the steady-state performance of induction and synchronous machines and compute performance measures.
	To validate and identify the machine parameters through test.
	To select the appropriate AC motor for different large power application.
	To analyze the stability of single machine – infinite bus system and form the grid to supply large load.
	To choose the appropriate fractional horse power motor as per the usage in daily life.
<b>(UEI301) Digital Electronics</b>	To describe the number systems, conversions and their applications.
	To apply minimization techniques such as K maps, Tabular method etc. for the design of digital circuits.
	To design combinational and sequential circuits.
	To differentiate various types of memories and their use in different applications.
	To demonstrate the concept of logic circuits and converters
<b>(UEE402) Transmission and Distribution of Power</b>	To understand the structure of power system
	To analyze the transmission line models and evaluates its performance parameters.
	To design the transmission lines under various working conditions
	To describe and select the configurations of different line insulators and evaluate their performance.
	To supervise the laying of cables and fault detection in cables.
	To design the distribution system network.
<b>(UEI501) Control Systems</b>	To distinguish between open loop and closed loop systems.
	To develop the mathematical models of different physical systems.
	To analyze the stability of a given control system.
	To explain the concept of modern control theory.
<b>(UEE501) Generalized Theory of Electrical Machines</b>	To explain the revolving field and reference frame theory.
	To develop mathematical model of three-phase AC machines and parameters in different reference frame.
	To simulate the transient performance of three-phase ac machines in different reference frames.

	To investigate the transient performance of different DC machines.
	To select special purpose small machines for different applications.
<b>(UEE502) High Voltage Engineering</b>	To conceptualize the idea of high voltage and safety measures involved
	To analyse the breakdown mechanism of solids, liquids and gases
	To design insulation associated with various power system components such as transformer, rotating machines and switchgear
	To analyse and calculate the circuit parameters involved in generation of high voltages
	To measure direct, alternating and impulse high voltage signals.
	To measure the dielectric loss and partial discharge involved in non-destructive high voltage tests
<b>(UEE503) Network Analysis and Synthesis</b>	To describe the underlying concepts of AC electric networks
	To solve electric circuits by applying various network laws and theorems
	To represent complex network as two port network and can use it for impedance matching, transmission line modelling etc
	To synthesize the RC, RL, LC networks for given function.
	To design the passive filter(s) and /or attenuator(s) for the various applications
<b>(UEE504) Power Electronics</b>	To identify the power–electronic devices and inference their usage as switch for energy conversion and control
	To select and design appropriate converter configuration/topology for typical power application such as DC drive, AC drive, HVDC and FACTS.
	To design the firing and commutation circuit for different converter configurations.
	To use power converters for harmonic mitigation, voltage and frequency control
<b>(UEE591) Summer Training</b>	To implement the project requiring individual and teamwork skills.
	To correlate the theoretical concepts with the real life industrial environment.
	To gather and analyze the scientific information.
	To communicate their work effectively through writing and presentation
<b>(UEI841) Advanced Control System</b>	To analyze the non-linear system behavior by phase plane and describing function methods and learn about the stability of linear and nonlinear systems by Lyapunov method
	To develop analysis and design skills in optimal control and robust control
	To assure knowledge of state space and state feedback in modern control systems.

	To design and fine tune PID controllers and demonstrate the roles of P, I and D in control
	To familiarize themselves with the scholarly literature in modern control systems
<b>(UEI503) Digital Signal Processing and Applications</b>	To express discrete-time signals analytically and visualize them in the time and frequency domain.
	To design and implementation digital filters.
	Illustrate the use of digital signal processors
<b>(UEE601) Flexible AC Transmission Systems</b>	To decide the scheme for power system stability and voltage control
	To decide the converter configuration for different power systems applications such as HVDC, FACTS etc.
	To decide the usage of different FACTS compensators for different purposes.
	To carry out load flow analysis of power system consisting FACTS compensators as well.
	To compute the harmonics and can suggest the harmonic mitigation using STATCOM
<b>(UEI504) Microprocessors and Applications</b>	To demonstrate the concept of microprocessor architecture.
	To program 8085 and 8086 microprocessors for different applications.
	To implementation on hardware interfacing of 8086 and 8085 with devices.
	To update with current trends in microprocessors and their applications
<b>(UEE602) Power System Analysis and Stability</b>	To develop an appropriate mathematical model of power system
	To carry out power flow analysis of practical power system for balanced three-phase system.
	To decide generation scheduling of thermal units leading to overall economy.
	To conduct studies during balanced and unbalanced faults to decide the fault levels and circuit breaker ratings.
	To analyze the stability of single machine-infinite bus system and can decide the critical clearing time of circuit breakers
<b>(UEE603) Switchgear and Protection</b>	To select the protection elements such as fuse, circuit breakers and relays etc. for a given configuration
	To explain the earthing requirement for residential and other purposes.
	To select required protection measures against overcurrent, overvoltage in transmission lines.
	To select suitable protection scheme for different power system equipment.
<b>(UEE801) Electric Drives</b>	To conceptualize the basic drive system and analyse it for different types of loads
	To analyse the motor situation during starting and braking

	To develop control circuitry and devices for control of motor
	To estimate the motor rating for different condition of load
	To design the converter circuit for control purpose along with its different configuration
	To use PLC and converter control to drive on the basis of energy efficiency
<b>(UEE802 )Intelligent Algorithms in Power System</b>	To implement fuzzy controllers by modelling the human intelligence into mathematical model
	To mathematically model the human learning capability and solve classification, control system and optimization problem.
	To obtain the optimum solution of well formulated optimization problem using evolutionary approach.
	To formulate hybrid intelligent algorithms for typical electrical application
<b>(UEE804) Operation and Control of Power</b>	To Decide the scheduling of thermal units and hydro-thermal units for overall economy.
	To Develop small scale model of alternator, excitation and governing systems.
	To Design and apply control for frequency and voltage of power system represented by single or multi-area
	To Comprehend power system security and contingency.
	To Computation of small scale and voltage stability.
<b>(UEE 793) Capstone Project</b>	To identify design goals and analyze possible approaches to meet given specifications with realistic engineering constraints.
	To design an electrical engineering project implementing an integrated design approach applying knowledge accrued in various professional courses.
	To perform simulations and incorporate appropriate adaptations using iterative synthesis.
	To use modern engineering hardware and software tools.
	To work amicably as a member of an engineering design team.
	To improve technical documentation and presentation skills.
<b>(UEE 791) Project Semester</b>	To acquire knowledge and experience of software and hardware practices in the area of project.
	To carry out design calculations and implementations in the area of project.
	To associate with the implementation of the project requiring individual and teamwork skills.
	To communicate their work effectively through writing and presentation.
	To demonstrate the knowledge of professional responsibilities and respect for ethics.
<b>(UEE712) Electrical Engineering Materials</b>	To explain the basic concepts of elementary material science.
	To elaborate the dielectric properties of insulators in static and alternating field.

	To explain the concept of superconductivity.
	To classify semiconductor materials and its properties.
<b>(UEE711) Alternate Sources of Energy</b>	To realise the national energy scenario and work for managing the different alternative energy resources available
	To design solar energy based system for various applications.
	To synthesize biomass energy and utilize it in house hold applications.
	To design wind energy based electric power generating system.
	To explore the application areas of Geothermal, Fuel cell, MHD and Ocean energy
	To analyse the operational characteristics of stand-alone generating unit for renewable energy applications.
<b>(UEI622) Data Networks</b>	To Explain the concept of computer networks and OSI reference model.
	To Describe the working of physical layer components/devices.
	To Elaborate the working of different protocols of computer networks.
	To Explain the routing algorithms, error detection and correction in data networks
<b>(UEI623) Object Oriented Programming and Applications</b>	To Demonstrate the concept of OOPS.
	To Have a practical hand on programming concepts by the use of conditional statements, pointers, arrays classes' polymorphism etc.
	To Demonstrate the inheritance concept, use of OOPs in data structures.
<b>(UEI511) Principles of Communication Engineering</b>	To Explain the basic concepts of communication systems, various AM and FM modulators.
	To Explain the working and application of AM receivers.
	To Describe the working of FM receivers and their applications.
	To Differentiate between various types of pulse modulation
	To Explain the working of audio communication and telephony system.
<b>(UEE521) Electric Machine Design</b>	To Demonstrate winding, core, and cooling requirement from design view point
	To Carry out requirement and design calculation for transformer.
	To Carry out design calculation and draw the skeleton of rotating electrical machine.
	To Explain the Analysis and Synthesis approaches as well as optimal design of electrical machines.
<b>(UEE522) Energy Auditing and Management</b>	To Analyze about energy scenario nationwide and worldwide
	To Decide about energy management in more effective way.
	To Analyze about various energy related aspect of electrical system.
	To Carry out financial management.

	To Conduct studies related to operational aspects of compressed air system and refrigeration system.
<b>(UEE523) High Voltage Transmission Systems</b>	To Compare AC and DC transmission systems.
	To Identify the suitable two-level/multilevel configuration for high power converters.
	To Select the suitable protection method for various converter faults.
	To Identify suitable reactive power compensation method.
	To Decide the configuration for harmonic mitigation on both AC and DC sides.
	To Simulate and/or carry out the AC-DC power flow analysis.
<b>(UEE524) Power Quality Monitoring and Conditioning</b>	To Reliably identify the sources of various power quality problems.
	To Estimate the impact of various power quality problems on appliances.
	To Educate the harmful effects of poor power quality and harmonics.
	To Decide the compensators and filters to keep the power quality indices within the standards.
<b>(UEE841) Industrial Electronics</b>	To Analyse the semiconductor controlled ac and DC drive system
	To Design an illumination system for domestic, industry and commercial sites.
	To Design an electric heating system for industrial purposes.
	To Design and develop a regulated power supply
	To Analyse and simulate the series and shunt compensators for power factor improvement in drive system.
<b>(UEE845) Microcontrollers and Applications</b>	To Describe the concept of microcontroller architectures.
	To Explain the addressing modes, data types and instruction set.
	To Program microcontroller for different applications including hardware interfacing
	To Explain the concept of advanced microcontrollers and latest trends.
<b>(UEE842) Power System Instrumentation</b>	To Use electrical and electronics instrument in power systems applications.
	To Able to use signal transmission techniques for specific power system purposes.
	To Analyze the functions of SCADA system
	To Demonstrate of power system instrumentation
<b>(UEE843) Power System Planning</b>	To Assess the generation adequacy in power system using probabilistic approach
	To Analyse the configuration of substations and power pools
	To Evaluate the peak demand and energy requirements of system using forecasting techniques.
	To Develop the solution methodology for optimizing the cost of power system under operation

<b>(UEI512) Robotics and Related Instrumentation</b>	To Explain the type of the drive and control systems used in robotics.
	To Describe the type of sensors and other instruments used in robotics.
	To Perform the robot language programming.
<b>(UEE844) Transients in Power Systems</b>	To Reliably distinguish between various switching transients and lightning surges
	To Analyse power system behaviour during switching transients and lightning surges.
	To Demonstrate the competence to design the protection scheme of power system equipment using ground wires, surge absorbers and arrestors.
	To Decide the insulation level of power system components to withstand the surge voltage.
<b>(UEE803) Load Dispatch and Communication</b>	To Explain state estimation and computational methods related to power system.
	To Analyze various components of modern energy control center.
	To Carry out the prediction and forecasting related to load.
	To Conduct studies related to various component of load dispatch center.
	To Decide the impact of system management
	To Decide the different modules for communication system.