



AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Approved by A.I.C.T.E., New Delhi & Permanently Affiliated to J.N.T.U-GV, Vizianagaram)

NAAC "B++" Accredited Institute

Cherukupally (Village), Near Tagarapuvalasa Bridge, Vizianagaram (Dist) -531162.

www.aietta.ac.in, principal@aietta.ac.in

Department of Electrical and Electronics Engineering

Program: B. Tech – Electrical and Electronics Engineering

Regulation: R19

Course Outcomes

No. of Courses: 82

I-I Sem	Course : English
CO-1	understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information
CO-2	ask and answer general questions on familiar topics and introduce oneself/others
CO-3	employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information
CO-4	recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs
CO-5	form sentences using proper grammatical structures and correct word forms
I-I Sem	Course : Mathematics-I
CO-1	utilize mean value theorems to real life problems
CO-2	solve the differential equations related to various engineering fields
CO-3	familiarize with functions of several variables which is useful in optimization
CO-4	Apply double integration techniques in evaluating areas bounded by region
CO-5	learn important tools of calculus in higher dimensions
I-I Sem	Course : Applied Chemistry
CO-1	<i>Explain</i> the theory of construction of battery and fuel cells.
CO-2	<i>Understand</i> the importance of materials like nano materials and fullerenes and their uses.
CO-3	<i>Understand</i> importance molecular machines
CO-4	Understand the principles of different analytical instruments.
CO-5	Explain the different applications of analytical instruments.
I-I Sem	Course : Programming For Problem Solving Using C
CO-1	To write algorithms and to draw flowcharts for solving problems
CO-2	To convert flowcharts/algorithms to C Programs, compile and debug programs
CO-3	To use different operators, data types and write programs that use two-way/ multi-way selection
CO-4	To select the best loop construct for a given problem



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CO-5	To design and implement programs to analyze the different pointer applications
I-I Sem Course : Applied Chemistry Lab	
CO-1	The students entering into the professional course have practically very little exposure to lab classes.
CO-2	The experiments introduce volumetric analysis; redox titrations with different indicators; EDTA titrations;
CO-3	Exposed to a few instrumental methods of chemical analysis.
I-II Sem Course : Mathematics - II	
CO-1	develop the use of matrix algebra techniques that is needed by engineers for practical applications
CO-2	solve system of linear algebraic equations using Gauss elimination, Gauss Jordan, Gauss Seidel
CO-3	evaluate approximating the roots of polynomial and transcendental equations by different algorithms
CO-4	apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals
CO-5	apply different algorithms for approximating the solutions of ordinary differential equations to its analytical computations
I-II Sem Course : Mathematics - II	
CO-1	develop the use of matrix algebra techniques that is needed by engineers for practical applications
CO-2	solve system of linear algebraic equations using Gauss elimination, Gauss Jordan, Gauss Seidel
CO-3	evaluate approximating the roots of polynomial and transcendental equations by different algorithms
CO-4	apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals
CO-5	apply different algorithms for approximating the solutions of ordinary differential equations to its analytical computations
I-II Sem Course : Mathematics - III	
CO-1	interpret the physical meaning of different operators such as gradient, curl and divergence
CO-2	estimate the work done against a field, circulation and flux using vector calculus
CO-3	apply the Laplace transform for solving differential equations
CO-4	find or compute the Fourier series of periodic signals



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CO-5	know and be able to apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms
I-II Sem Course : Applied Physics	
CO-1	Explain the concept of polarization in dielectric materials
CO-2	Summarize various types of polarization of dielectrics .
CO-3	Interpret Lorentz field and Claussius- Mosotti relation in dielectrics.
CO-4	classify the magnetic materials based on susceptibility and their temperature dependence
CO-5	Explain the applications of dielectric and magnetic materials .
I-II Sem Course : Fundamentals Of Computer Science	
CO-1	Explain the concept of input and output devices of Computers and how it works and recognize the basic terminology used in computer programming
CO-2	Recognize the Computer networks, types of networks and topologies.
CO-3	Summarize the concepts of Operating Systems and Databases.
CO-4	Recite the Advanced Computer Technologies
CO-5	Recite the Distributed Computing & Wireless Networks.
I-II Sem Course : Electrical Circuit Analysis - I	
CO-1	Solve Various electrical networks in presence of active and passive elements
CO-2	Solve Electrical networks with network topology concepts.
CO-3	Solve Any magnetic circuit with various dot conventions.
CO-4	Solve Any R, L, C network with sinusoidal excitation.
CO-5	Solve Any R, L, network with variation of any one of the parameters i.e R, L, C and f.
I-II Sem Course : Electrical Engineering Workshop	
CO-1	Explain the limitations, tolerances, safety aspects of electrical systems and wiring.
CO-2	Select wires/cables and other accessories used in different types of wiring.
CO-3	Explain simple lighting and power circuits.
II-I Sem Course : Electrical Circuit Analysis-II	



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CO-1	Understand three-phase circuits under balanced and unbalanced condition
CO-2	Find the transient response of electrical networks for different types of excitations
CO-3	Find parameters for different types of network
CO-4	Realize electrical equivalent network for a given network transfer function
CO-5	Extract different harmonics components from the response of an electrical network.
II-I Sem Course : Electrical Machines – I	
CO-1	Assimilate the concepts of electromechanical energy conversion.
CO-2	Mitigate the ill-effects of armature reaction and improve commutation in dc machines.
CO-3	Understand the torque production mechanism and control the speed of dc motors
CO-4	Analyze the performance of single phase transformers
CO-5	Predetermine regulation, losses and efficiency of single phase transformers
II-I Sem Course : Electronic Devices and Circuits	
CO-1	Understand the concepts of Semiconductor Technology
CO-2	Appraise the construction & operation of electronic devices. □
CO-3	Develop the biasing circuits using the electronic devices.
CO-4	Analyze model the amplifier circuits.
CO-5	Analyse the characteristics of the devices
II-I Sem Course : Electromagnetic Fields	
CO-1	Determine electric fields and potentials using Gauss's law or solving Laplace's or Poisson's equations, for various electric charge distributions.
CO-2	Calculate and design capacitance, energy stored in dielectrics.
CO-3	Calculate the magnetic field intensity due to current, the application of Ampere's law and the Maxwell's second and third equations.
CO-4	Determine the magnetic forces and torque produced by currents in magnetic field
CO-5	Determine self and mutual inductances and the energy stored in the magnetic field.
II-I Sem Course : Managerial Economics and Financial Analysis	
CO-1	knowledge of estimating the Demand and demand elasticities for a product



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CO-2	Knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs.
CO-3	Understand the nature of different markets and Price Output determination under various market conditions and also to have the knowledge of different Business Units.
CO-4	Prepare Financial Statements and the usage of various Accounting tools for Analysis
CO-5	Evaluate various investment project proposals with the help of capital budgeting techniques for decision making.
II-I Sem Course : Electrical Circuits Lab	
CO-1	Apply various theorems, determination of self and mutual inductances, of a given electric circuits.
CO-2	Draw locus diagrams, waveforms and phasor diagrams for lagging and leading networks.
CO-3	Apply various theorems for two port parameters of a given electric circuits.
II-II Sem Course : Essence of Indian Traditional Knowledge	
CO-1	Understand the concept of Traditional knowledge and its importance
CO-2	Know the need and importance of protecting traditional knowledge
CO-3	Know the various enactments related to the protection of traditional knowledge
CO-4	Understand the concepts of Intellectual property to protect the traditional knowledge
CO-5	Explain the acts related to schedule tribes, traditional forest dwellers, plants protection and farmers to inculcate the legal protection information.
II-II Sem Course : Electrical Measurements and Instrumentation	
CO-1	Choose right type of instrument for measurement of ac and dc Electrical quantities
CO-2	Choose right type of instrument for measurement of power and power factor.
CO-3	Select right type for measurement of R, L,C.
CO-4	Understand the effectiveness of Transducer.
CO-5	Understand Digital Meters.
II-II Sem Course : Electrical Machines - II	
CO-1	Explain the operation and performance of three phase induction motor.
CO-2	Analyze the torque-speed relation, performance of induction motor and induction generator.



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CO-3	Explain design procedure for transformers and three phase induction motors
CO-4	Implement the starting of single phase induction motors.
CO-5	Perform winding design and predetermine the regulation of synchronous generators.
II-II Sem Course : Digital Electronics	
CO-1	Classify different number systems and apply to generate various codes.
CO-2	Use the concept of Boolean algebra in minimization of switching functions
CO-3	Design different types of combinational logic circuits.
CO-4	knowledge of flip-flops in designing of Registers and counters
CO-5	Operation and design methodology for synchronous sequential circuits and algorithmic state machines.
II-II Sem Course : Control Systems	
CO-1	Derive the transfer function of physical systems and determination of overall transfer function using block diagram algebra and signal flow graphs.
CO-2	Determine time response specifications of second order systems and to determine error constants.
CO-3	Analyze absolute and relative stability of LTI systems using Routh's stability criterion and the root locus method.
CO-4	Analyze the stability of LTI systems using frequency response methods
CO-5	Design Lag, Lead, Lag-Lead compensators to improve system performance from Bode diagrams.
II-II Sem Course : Power Systems-I	
CO-1	Identify the different components of thermal power plants
CO-2	Identify the different components of nuclear Power plants
CO-3	Identify the different components of air and gas insulated substations.
CO-4	Identify single core and three core cables with different insulating materials.
CO-5	Analyse the different economic factors of power generation and tariffs.
II-II Sem Course : Signals and Systems	
CO-1	Characterize the signals and systems and principles of vector spaces, Concept of orthogonality
CO-2	Analyze the continuous-time signals and continuous-time systems using Fourier series, Fourier transform and Laplace transform.



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CO-3	Apply sampling theorem to convert continuous-time signals to discrete-time signal and reconstruct back.
CO-4	Understand the relationships among the various representations of LTI systems.
CO-5	Understand the Concepts of convolution, correlation, Energy and Power density spectrum and their relationships.
II-II Sem Course : Electrical Machines –I Laboratory	
CO-1	Determine and predetermine the performance of DC machines and Transformers
CO-2	Control the speed of DC motor
CO-3	Obtain three phase to two phase transformation
II-II Sem Course : Professional Ethics and Human Values	
CO-1	Identify and analyze an ethical issue in the subject matter under investigation or in a relevant field
CO-2	Identify the multiple ethical interests at stake in a real-world situation or practice
CO-3	Articulate what makes a particular course of action ethically defensible
CO-4	Assess their own ethical values and the social context of problems
CO-5	Identify ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, the objective presentation of data, and the treatment of human subjects
III-I Sem Course : Power systems - II	
CO-1	Understand parameters of various types of transmission lines during different operating conditions.
CO-2	Understand the performance of short and medium transmission lines.
CO-3	Understand travelling waves on transmission lines
CO-4	Understand various factors related to charged transmission lines.
CO-5	Understand sag/tension of transmission lines and performance of line insulators.
III-I Sem Course : Power Electronics	
CO-1	Explain the characteristics of various power semiconductor devices and analyze the static and dynamic characteristics of SCR's.
CO-2	Design firing circuits for SCR.
CO-3	Explain the operation of single phase full-wave converters and analyze harmonics in the input current.



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CO-4	Explain the operation of three phase full-wave converters.
CO-5	Analyze the operation of different types of DC-DC converters
III-I Sem Course : Linear IC Applications	
CO-1	Design circuits using operational amplifiers for various applications.
CO-2	Analyze and design amplifiers and active filters using Op-amp.
CO-3	Diagnose and trouble-shoot linear electronic circuits.
CO-4	Understand the gain-bandwidth concept and frequency response of the amplifier configurations.
CO-5	Understand the gain-bandwidth concept and frequency response of the amplifier configurations.
III-I Sem Course : Digital signal Processing	
CO-1	Understand the concepts of signal processing & transforms.
CO-2	Appraise the Fast Fourier algorithm.
CO-3	Design FIR and IIR filters
CO-4	Appreciate the concepts of multirate signal processing.
CO-5	Interpret the finite word length effects on functioning of digital filters
III-I Sem Course : Microprocessors and Microcontrollers	
CO-1	Understand the Microprocessor capability in general and explore the evaluation of microprocessors.
CO-2	Understand the addressing modes of Microprocessors
CO-3	Understand the Microcontroller capability
CO-4	Program Microprocessors and Microcontrollers
CO-5	Interface Microprocessors and Microcontrollers with other electronic devices
III-I Sem Course : Electrical Machines– II Laboratory	
CO-1	Assess the performance of single phase and three phase induction motors.
CO-2	Control the speed of three phase induction motor
CO-3	Predetermine the regulation of three-phase alternator by various methods



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III-I Sem	Course : Control Systems Laboratory
CO-1	Analyze the performance and working Magnetic amplifier, D.C and A.C. servo motors and synchronous motors.
CO-2	Design P,PI,PD and PID controllers
CO-3	Design lag, lead and lag-lead compensators
III-I Sem	Course : Electrical Measurements and Instrumentation Laboratory
CO-1	Measure the electrical parameters voltage, current, power, energy and electrical characteristics of resistance, inductance and capacitance.
CO-2	Test transformer oil for its effectiveness.
CO-3	Measure the parameters of inductive coil
III-I Sem	Course : Socially Relavent Projects
CO-1	Provide a solutions the technological problems of society
CO-2	Suggest technological changes which suits current needs of society
CO-3	Explain new technologies available for problems of the society.
III-II Sem	Course : Electric Drives
CO-1	Explain the fundamentals of electric drive and different electric braking methods.
CO-2	Analyze the operation of three phase converter fed dc motors and four quadrant operations of dc motors using dual converters.
CO-3	Describe the converter control of dc motors in various quadrants of operation
CO-4	Know the concept of speed control of induction motor by using AC voltage controllers and voltage source inverters
CO-5	Differentiate the stator side control and rotor side control of three phase induction motor..
III-II Sem	Course : Power System Analysis
CO-1	Draw impedance diagram for a power system network and to understand per unit quantities.
CO-2	Form Y bus and Z bus for a power system networks.
CO-3	Understand the load flow solution of a power system using different methods
CO-4	Find the fault currents for all types faults to provide data for the design of protective devices.
CO-5	Find the sequence components of currents for unbalanced power system network.



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III-II Sem	
Course : Data Structures	
CO-1	Distinguish between procedures and object oriented programming.
CO-2	Apply advanced data structure strategies for exploring complex data structures
CO-3	Compare and contrast various data structures and design techniques in the area of Performance.
CO-4	Implement data structure algorithms through C++. • Incorporate data structures into the applications such as binary search trees, AVL and B Trees
CO-5	Implement all data structures like stacks, queues, trees, lists and graphs and compare their Performance and trade offs
III-II Sem	
Course : Digital Control Systems	
CO-1	Learn the advantages of discrete time control systems and the “know how” of various associated accessories.
CO-2	Understand z-transformations and their role in the mathematical analysis of different systems (like Laplace transforms in analog systems).
CO-3	Learn the stability criterion for digital systems and methods adopted for testing the same are explained
CO-4	Understand the conventional and state space methods of design are also introduced.
CO-5	Explores and practices different analysis in different parlance
III-II Sem	
Course : Digital IC Applications	
CO-1	Understand the structure of commercially available digital integrated circuit families.
CO-2	Learn the IEEE Standard 1076 Hardware Description Language (VHDL).
CO-3	Model complex digital systems at several levels of abstractions, behavioral, structural, simulation, synthesis and rapid system prototyping.
CO-4	Analyze and design basic digital circuits with combinatorial and sequential logic circuits using VHDL.
CO-5	Design frequency selective circuits using OPAMP for audio and radio frequency ranges.
III-II Sem	
Course : Communication Systems	
CO-1	Understand the basics of communication system, analog and digital modulation techniques
CO-2	Apply the knowledge of digital electronics and understand the error control coding techniques.
CO-3	Summarize different types of communication systems and its requirements



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III-II Sem	Course : Computer Networks
CO-1	Understand OSI and TCP/IP models
CO-2	Analyze MAC layer protocols and LAN technologies
CO-3	Design applications using internet protocols
CO-4	Understand routing and congestion control algorithms
CO-5	Understand how internet works
III-II Sem	Course: Internet of things Applications to Electrical Engineering
CO-1	Know the various fundamentals, architectures and technologies of Internet of Things
CO-2	Understand various communication technologies used in the Internet of Things.
CO-3	Understand the various device connectivity methods using web and internet in the IoT environment.
CO-4	Understand various data acquisition methods, data handling using cloud for IoT applications.
CO-5	Know the implementation of IoT from the case studies like Smart Home, Smart city, etc.
III-II Sem	Course : VLSI Design
CO-1	Understand the insights of the MOS devices and its characteristics
CO-2	Appreciate the different VLSI process technologies.
CO-3	Design the CMOS combinational logic circuits and its layout.
CO-4	Develop the sequential circuits and clocking schemes.
CO-5	Realize the Design flow of application-specific Integrated circuit
III-II Sem	Course : Cloud Computing
CO-1	Understanding the key dimensions of the challenge of Cloud Computing
CO-2	Assessment of the economics , financial, and technological implications for selecting cloud computing for own organization
CO-3	Assessing the financial, technological, and organizational capacity of employer’s for actively initiating and installing cloud-based applications.
CO-4	Assessment of own organizations’ needs for capacity building and training in cloud computing-related IT areas
CO-5	Analyze various cloud programming models and apply them to solve problems on the cloud.



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III-II Sem	Course : Renewable Energy sources
CO-1	Analyze solar radiation data, extraterrestrial radiation, and radiation on earth's surface.
CO-2	Develop maximum power point techniques in solar PV and wind energy systems.
CO-3	Explain wind energy conversion systems, wind generators, power generation.
CO-4	Explain basic principle and working of hydro, tidal, biomass, fuel cell and geothermal systems.
CO-5	Design solar photo voltaic systems.
III-II Sem	Course : Essentials of Analog and Digital Electronics
CO-1	Design and develop circuits using analog and digital components.
CO-2	Understand the different generators and analyzers
CO-3	Appreciate the use of display units.
CO-4	Design Analog to Digital and Digital to Analog Converters.
CO-5	Design and analyze combinational and sequential circuits.
III-II Sem	Course : Electrical estimation and Costing
CO-1	Identify the various electrical apparatus and their interconnections.
CO-2	Select suitable electrical supply system and design earthing systems of various electric loads.
CO-3	Estimate the cost for installation of wiring for different types of building and small industries.
CO-4	Identify the components of electrical substations
CO-5	Design suitable control circuit for starting of three phase induction motor and synchronous motor.
III-II Sem	Course : Power Electronics Devices and circuits
CO-1	Explain the basics of semiconductor devices and use of Power diode
CO-2	Know the operation and characteristics of BJT and power MOSFETs.
CO-3	Explain the basic difference of thyristors and GTOs in their physics and characteristics
CO-4	Know the operation of IGBT, emerging devices and circuits.
CO-5	Analyze various single phase and three phase power converter circuits and understand their applications.



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III-II Sem	Course : Fundamentals of Electrical Machines
CO-1	Apply fundamentals in various electrical circuits.
CO-2	Explain the operation and characteristics of DC machines
CO-3	Determine the efficiency and regulation of transmission
CO-4	Explain the operation and starting methods of Induction Motors.
CO-5	Apply the applications of Synchronous Machines.
III-II Sem	Course : Power Electronics Laboratory
CO-1	Study the characteristics of various power electronic devices and analyze gate drive circuits of IGBT.
CO-2	Analyze the performance of single-phase and three-phase full-wave bridge converters with both resistive and inductive loads and inductive loads.
CO-3	Understand the operation of single phase AC voltage regulator with resistive
III-II Sem	Course : Micro Processors and Micro Controllers Laboratory
CO-1	Write assembly language program using 8086 micro based on arithmetic, logical, and shift operations
CO-2	Interface 8086 with I/O and other devices
CO-3	Do parallel and serial communication using 8051 & PIC 18 micro controllers
III-II Sem	Course : Employability Skills
CO-1	Solve aptitude and reasoning problems
CO-2	Apply the soft skills in dealing the issues related to employability
CO-3	Successful in getting employment in campus placement interview
IV-I Sem	Course : Switchgear and Protection
CO-1	Understand the principles of arc interruption for application to high voltage circuit breakers of air, oil, vacuum, SF6 gas type.
CO-2	Understand the working principle and operation of different types of electromagnetic protective relays
CO-3	Students acquire knowledge of faults and protective schemes for high power generator and transformers.
CO-4	Improves the ability to understand various types of protective schemes used for feeders and bus bar protection



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CO-5	Understand different types of static relays and their applications
IV-I Sem Course : Linear IC Applications	
CO-1	Design circuits using operational amplifiers for various applications.
CO-2	Analyze and design amplifiers and active filters using Op-amp.
CO-3	Diagnose and trouble-shoot linear electronic circuits
CO-4	Understand the gain-bandwidth concept and frequency response of the amplifier configurations.
CO-5	Understand thoroughly the operational amplifiers with linear integrated circuits
IV-I Sem Course : OOPS Through JAVA	
CO-1	Understand Java programming concepts and utilize Java Graphical User Interface in Program writing.
CO-2	Write, compile, execute and troubleshoot Java programming for networking concepts.
CO-3	Build Java Application for distributed environment.
CO-4	Design and Develop multi-tier applications
CO-5	Identify and Analyze Enterprise applications.
IV-I Sem Course : Renewable Energy systems	
CO-1	Analyze solar radiation data, extraterrestrial radiation, and radiation on earth's surface.
CO-2	Design solar thermal collectors, solar thermal plants
CO-3	Design solar photo voltaic systems
CO-4	Develop maximum power point techniques in solar PV and wind energy systems
CO-5	Explain wind energy conversion systems, wind generators, power generation
IV-I Sem Course : Utilization of Electrical Energy	
CO-1	Understand various levels of illuminosity produced by different illuminating sources and able to estimate the illumination levels produced by various sources and recommend the most efficient illuminating sources and should be able to design different lighting systems by taking inputs and constraints in view.
CO-2	Identify most appropriate heating and welding techniques for suitable applications
CO-3	Identify a suitable motor for electric drives and industrial applications



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CO-4	Determine the speed/time characteristics of different types of traction systems and determination of various traction parameters.
CO-5	Know the necessity and usage of different energy storage schemes for different applications.
IV-I Sem Course : Data Base Management systems	
CO-1	Describe a relational database and object-oriented database
CO-2	Create, maintain and manipulate a relational database using SQL
CO-3	Describe ER model and normalization for database design
CO-4	Examine issues in data storage and query processing and can formulate appropriate solutions.
CO-5	Design and build database system for a given real world problem
IV-I Sem Course : Advanced Control Systems	
CO-1	Formulate different state models in canonical forms.
CO-2	Design of state feedback control using the pole placement technique and state observer design for a given control system.
CO-3	Analyse of nonlinear system using the describing function technique and determine the stability of a linear autonomous system using lypnov method.
CO-4	Determine minimization of functionals using calculus of variation studied
CO-5	Formulate and solve the LQR problem and riccati equation.
IV-I Sem Course : Electrical Machine Design	
CO-1	Design main dimensions of rotating machines
CO-2	Design transformers and determine main dimensions
CO-3	Design field circuit of DC machines and Synchronous machines.
CO-4	Design armature of DC machines and AC machines.
CO-5	Design concepts of synchronous machines and solve the problems related to design
IV-I Sem Course : Hybrid electric Vehicles	
CO-1	Know the concept of electric vehicles and hybrid electric vehicles
CO-2	Familiar with different configuration of hybrid electric vehicles
CO-3	Understand the power converters used in hybrid electric vehicles
CO-4	Know different batteries and other energy storage systems.



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CO-5	Analyze and design various components of electric and hybrid vehicles with environment concern.
IV-I Sem Course : Operating systems	
CO-1	Design various Scheduling algorithms
CO-2	Apply the principles of concurrency.
CO-3	Design deadlock, prevention and avoidance algorithms.
CO-4	Compare and contrast various memory management schemes.
CO-5	Design and Implement a prototype file systems.
IV-I Sem Course : Neural networks and FUZZY Logic	
CO-1	Know different models of artificial neuron & Use learning methods of ANN.
CO-2	Use different paradigms of ANN
CO-3	Classify between classical and fuzzy sets.
CO-4	Use different modules of Fuzzy logic controller.
CO-5	Apply Neural Networks and fuzzy logic for real-time applications
IV-I Sem Course : Hih Voltage engineering	
CO-1	Understand theory of breakdown and withstand phenomenon for all types of dielectric materials
CO-2	Acquaint with the techniques of generation of AC,DC and Impulse voltages.
CO-3	Apply knowledge for measurement of high AC,DC, Impulse voltages and currents.
CO-4	Be in a position to measure dielectric property of materials used in HV equipment
CO-5	Know the testing techniques of various equipments used in HV engineering
IV-I Sem Course : Energy Auditing and Demand side Management	
CO-1	Explain energy efficiency, conservation and various technologies.
CO-2	Design energy efficient lighting systems
CO-3	Calculate power factor of systems and propose suitable compensation techniques.
CO-4	Explain energy conservation in HVAC systems.
CO-5	Calculate life cycle costing analysis and return on investment on energy efficient technologies.



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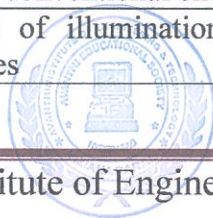
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IV-I Sem	Course : Linear & Digital IC Applications Lab
CO-1	Understand the characteristics of ICs-741, 555, 565, 566.
CO-2	Apply the concepts of IC 741 for different applications
CO-3	Analyse the data connection circuits and digital circuits.
IV-I Sem	Course : Power systems & simulation Lab
CO-1	Determine the parameters of various power system components which are frequently occur in power system studies and he can execute energy management systems functions at load dispatch center.
CO-2	Analyze the performance of transmission lines and relays
CO-3	Analyze different types of short-circuit faults which occur in power systems
IV-II Sem	Course : Power system operation and Control
CO-1	Compute optimal scheduling of Generators
CO-2	Understand hydrothermal scheduling.
CO-3	Understand the unit commitment problem.
CO-4	Understand importance of the frequency
CO-5	Understand importance of PID controllers in single area and two area systems
IV-II Sem	Course : Measurements and Instrumentation
CO-1	Choose right type of instrument for measurement of ac and dc Electrical quantities.
CO-2	Choose right type of instrument for measurement of power and power factor.
CO-3	Select right type for measurement of R, L,C.
CO-4	Understand the effectiveness of Transducer.
CO-5	Understand Digital Meters
IV-II Sem	Course : Fundamentals of Utilization of Electrical energy
CO-1	Know the various sources of electrical energy and its generation technologies for conventional and non-conventional energy sources.
CO-2	Know various types of illumination equipment, illumination measurement and illumination techniques





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CO-3	Learn about various methods used for electrical energy based heating and welding applications.
CO-4	Know about the mechanisms, equipment and technology used in the electric traction.
CO-5	Understand the importance of electrical earthing, earthing equipment and electrical earthing measurement methods.
IV-II Sem Course : concepts of Power System Engineering	
CO-1	Gain knowledge on types of power plants
CO-2	Learn about transmission and distribution concepts
CO-3	Understand protection and grounding methods.
CO-4	Learn the economic aspects of electrical energy.
CO-5	Understand the power factor improvement and voltage control.
IV-II Sem Course : Basics of Control Systems	
CO-1	Derive the transfer function of physical systems and determination of overall transfer function using block diagram algebra and signal flow graphs.
CO-2	Determine time response specifications of second order systems and to determine error constants.
CO-3	Analyze absolute and relative stability of LTI systems using Routh’s stability criterion and the root locus method.
CO-4	Analyze the stability of LTI systems using frequency response methods.
CO-5	Represent physical systems as state models and determine the response. Understanding the concepts of controllability and observability.
IV-II Sem Course : Energy Audit	
CO-1	Explain energy efficiency, conservation and various technologies
CO-2	Design energy efficient lighting systems.
CO-3	Calculate power factor of systems and propose suitable compensation techniques.
CO-4	Explain energy conservation in HVAC systems.
CO-5	Calculate life cycle costing analysis and return on investment on energy efficient Technologies.
IV-II Sem Course : Electrical distribution Systems	
CO-1	Understand various factors of distribution system.
CO-2	Design the substation and feeders.



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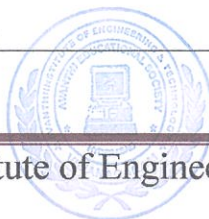
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CO-3	Determine the voltage drop and power loss
CO-4	Understand the protection and its coordination.
CO-5	Understand the effect of compensation for p.f improvement.
IV-II Sem Course : HVAC & DC Transmission	
CO-1	Acquaint with HV transmission system with regard to power handling capacity, losses, conductor resistance and electrostatic field associate with HV. Further knowledge is gained in area of bundle conductor system to improve electrical and mechanical performance.
CO-2	Develop ability for determining corona, radio interference, audible noise generation and frequency spectrum for single and three phase transmission lines.
CO-3	Acquire knowledge in transmission of HVDC power with regard to terminal equipments, type of HVDC connectivity and planning of HVDC system.
CO-4	Develop knowledge with regard to choice of pulse conversion, control characteristic, Firing angle control and effect of source impedance.
CO-5	Develop knowledge of reactive power requirements of conventional control, filters and reactive power compensation in AC. side of HVDC system.
IV-II Sem Course : Flexible Alternating Current Transmission Systems	
CO-1	Understand power flow control in transmission lines using FACTS controllers.
CO-2	explain operation and control of voltage source converter
CO-3	Analyze compensation methods to improve stability and reduce power oscillations in the transmission lines.
CO-4	Explain the method of shunt compensation using static VAR compensators
CO-5	Understand the methods of compensations using series compensators.
IV-II Sem Course : Power Quality	
CO-1	Differentiate between different types of power quality problems.
CO-2	Explain the sources of voltage sag, voltage swell, interruptions, transients, long duration over voltages and harmonics in a power system.
CO-3	Analyze power quality terms and power quality standards.
CO-4	Explain the principle of voltage regulation and power factor improvement methods.
CO-5	Demonstrate the relationship between distributed generation and power quality.
IV-II Sem Course : Smart Grid	





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CO-1	Understand smart grids and analyse the smart grid policies and developments in smart grids
CO-2	Develop concepts of smart grid technologies in hybrid electrical vehicles etc.
CO-3	Understand smart substations, feeder automation, GIS etc.
CO-4	Analyse micro grids and distributed generation systems
CO-5	Analyse the effect of power quality in smart grid and to understand latest developments in ICT for smart grid.
IV-II Sem Course : Special Electrical Machines	
CO-1	Distinguish between brush dc motor and brush less dc motor.
CO-2	Explain the performance and control of stepper motors, and their applications
CO-3	Explain theory of operation and control of switched reluctance motor.
CO-4	Explain the theory of travelling magnetic field and applications of linear motors.
CO-5	Understand the significance of electrical motors for traction drives.
IV Sem -II Course: Project	
CO-1	Formulate., and apply mathematical, science and engineering principles to solve real time engineering problems
CO-2	Test the existing data, communicate and conduct research on complex problems using modern tools
CO-3	Validate the obtained results on contemporary issues related to society and environment
CO-4	Determine effectively the engineering principles used in their project individually and as a team as per the norms of engineering practice
CO-5	Structure future work to promote life long learning in the context of technological adaptation.




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