TRINITY COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE & Affiliated to JNTU Hyderabad)

PEDDAPALLY-505172, Dist. Peddapalli. (T.S)

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Department of ECE Course Outcomes

I Year I Semester

1. Mathematics-I

CO1: Analyze and solve systems of linear equations using matrix methods.
CO2: Apply eigen values and eigenvectors to reduce quadratic forms into canonical forms.
CO3: Evaluate the convergence of sequences and series using standard tests.
CO4: Solve problems using mean value theorems and evaluate areas and volumes through integration.
CO5: Determine extreme values of multivariable functions and apply partial differentiation in engineering problems.

2. Applied Physics

CO1: Understand quantum mechanics principles and solve problems involving wave-particle duality.
CO2: Explain the properties and applications of semiconductors and diodes.
CO3: Evaluate the performance characteristics of optoelectronic devices like LEDs and solar cells.
CO4: Describe the principles of lasers and optical fibers and their engineering applications.
CO5: Apply Maxwell's equations to analyze electromagnetic waves and magnetic materials.

3. Programming for Problem Solving

CO1: Develop flowcharts and algorithms for problem-solving and implement them in C.
CO2: Use arrays, pointers, and structures to manage data efficiently in programs.
CO3: Apply file handling and preprocessor directives to manage input/output operations.
CO4: Implement recursive solutions and dynamic memory allocation in complex problems.
CO5: Analyze and optimize sorting and searching algorithms for various data structures.

4. Engineering Graphics

CO1: Develop scales and conic sections using engineering drawing principles.
CO2: Construct orthographic projections for points, lines, and planes.
CO3: Generate sectional views and auxiliary views of solids like cylinders and pyramids.
CO4: Design the development of surfaces for solids and study intersections of solids.
CO5: Create isometric projections and convert between orthographic and isometric views.

I Year II Semester

5. Mathematics-II

CO1: Solve first-order differential equations using exact, linear, and Bernoulli's methods.
CO2: Analyze higher-order linear differential equations and apply them to engineering problems.
CO3: Evaluate double and triple integrals to compute areas, volumes, and centers of mass.
CO4: Determine gradients, divergences, and curls of scalar and vector fields.
CO5: Apply vector integral theorems (Green's, Gauss's, and Stokes') in physical problems.

6. Chemistry

CO1: Relate molecular structure theories to bonding and conductance in materials.
CO2: Analyze water treatment methods and assess the quality of potable water.
CO3: Explain corrosion mechanisms and methods for its control in industrial applications.
CO4: Apply stereochemistry principles in reaction mechanisms and drug synthesis.
CO5: Utilize spectroscopy techniques for material characterization and applications.

7. Basic Electrical Engineering

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CO1: Analyze DC circuits using network theorems and solve first-order transients in RL and RC circuits.
CO2: Evaluate single-phase and three-phase AC circuits for power factor and resonance.
CO3: Understand the working principles and characteristics of transformers.
CO4: Analyze the torque-speed characteristics of DC and AC machines.
CO5: Design basic electrical installations including earthing and power factor improvement.

8. English

CO1: Build vocabulary and identify common grammatical errors in technical communication.
CO2: Enhance comprehension and drafting skills for professional correspondence.
CO3: Apply principles of effective writing in essays, reports, and formal letters.
CO4: Develop skills for précis writing and essay organization.
CO5: Create structured technical reports with appropriate formatting and content.

II Year I Semester

9. Electronic Devices and Circuits

CO1: Analyze diode applications including rectifiers, clippers, and clampers.
CO2: Design BJT biasing circuits and understand stabilization techniques.
CO3: Compare the characteristics of BJTs, FETs, and other special devices.
CO4: Design small-signal amplifiers using h-parameters.
CO5: Develop FET-based amplifier circuits and understand MOSFET operations.

10. Network Analysis and Transmission Lines

CO1: Solve electrical networks using network topology and coupled circuits concepts.
CO2: Analyze transient and steady-state responses of RC, RL, and RLC circuits.
CO3: Determine the parameters of two-port networks and their applications.
CO4: Evaluate transmission line characteristics using Smith charts and impedance matching.
CO5: Analyze wave propagation and distortion in transmission lines.

11. Digital System Design

CO1: Understand the principles of Boolean algebra and apply minimization techniques to simplify digital logic circuits.
CO2: Design and analyze combinational circuits, including multiplexers, decoders, encoders, and adders.
CO3: Develop sequential circuits using flip-flops, counters, and registers for practical applications.
CO4: Explore finite state machines (FSMs) and implement state diagrams for system design.
CO5: Design digital circuits using VHDL and verify them through simulation tools.

12. Signals and Systems

CO1: Classify and analyze different types of signals and systems based on their properties.
CO2: Represent signals using Fourier series and Fourier transforms and interpret their spectral characteristics.
CO3: Apply Laplace and Z-transforms to analyze continuous and discrete-time systems.
CO4: Evaluate system behavior using convolution and system stability using impulse response.
CO5: Understand sampling theorem and reconstruct signals from sampled data in practical applications.

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13. Probability Theory and Stochastic Processes

CO1: Understand the fundamental concepts of probability and apply them to solve engineering problems.

CO2: Analyze random variables and their distributions to evaluate statistical measures such as mean, variance, and moments.

CO3: Derive and interpret joint distributions, conditional probability, and independence of random variables.

CO4: Apply concepts of random processes and classify them into stationary and non-stationary processes.

CO5: Analyze correlation functions and power spectral density to understand the frequency domain characteristics of random processes.

II Year II Semester

14. Laplace Transforms, Numerical Methods & Complex Variables

CO1: Apply Laplace transforms to solve linear differential equations and system modeling problems.

CO2: Evaluate integrals and solve differential equations using numerical techniques such as trapezoidal and Simpson's rules.

CO3: Solve algebraic and transcendental equations using numerical methods like Newton-Raphson and bisection.

CO4: Analyze complex variables to understand their applications in functions, limits, and continuity.

CO5: Use Cauchy's integral theorem and residue theorem to evaluate complex integrals in engineering problems.

15. Electromagnetic Fields and Waves

CO1: Apply vector calculus to analyze static electric and magnetic fields in different coordinate systems.

CO2: Evaluate electric potential, capacitance, and energy in various charge distributions.

CO3: Analyze magnetic fields using Ampere's Law, Biot-Savart Law, and magnetic boundary conditions.

CO4: Derive and interpret Maxwell's equations for time-varying electromagnetic fields.

CO5: Understand electromagnetic wave propagation in different media and evaluate parameters such as reflection, transmission, and polarization.

16. Analog and Digital Communications

CO1: Understand the principles of amplitude and angle modulation.

CO2: Analyze modulation and demodulation techniques for AM and FM.

CO3: Explore PCM, DM, and ASK/FSK/PSK digital modulation schemes.

CO4: Evaluate the performance of communication systems under noise.

CO5: Study information theory and coding techniques for error correction.

17. Linear IC Applications

CO1: Explain the operation of ideal and practical operational amplifiers.

CO2: Design circuits for amplifiers, oscillators, and wave-shaping using op-amps.

CO3: Analyze the working of voltage regulators and power amplifiers.

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CO4: Explore data converters including ADC and DAC circuits.
CO5: Study special ICs like timers, PLL, and their applications.

18. Electromagnetic Fields and Waves

CO1: Apply vector calculus to analyze static electric and magnetic fields in different coordinate systems.
CO2: Evaluate electric potential, capacitance, and energy in various charge distributions.
CO3: Analyze magnetic fields using Ampere's Law, Biot-Savart Law, and magnetic boundary conditions.
CO4: Derive and interpret Maxwell's equations for time-varying electromagnetic fields.
CO5: Understand electromagnetic wave propagation in different media and evaluate parameters such as reflection, transmission, and polarization.

III Year I Semester

19. Microprocessors and Microcontrollers

CO1: Explain the architecture and instruction set of 8086 microprocessors.
CO2: Develop assembly language programs for arithmetic and logical operations.
CO3: Interface peripheral devices with microprocessors using interfacing techniques.
CO4: Explore the architecture and features of 8051 microcontrollers.
CO5: Design and implement embedded systems using microcontrollers.

20. Data Communications and Networks

CO1: Understand data communication concepts and transmission media.
CO2: Explain error detection, correction techniques, and data-link protocols.
CO3: Analyze network layer protocols, addressing, and routing mechanisms.
CO4: Explore transport layer services and protocols like TCP and UDP.
CO5: Examine application layer protocols and network security fundamentals.

21. Control Systems

CO1: Model physical systems using transfer functions and block diagrams.
CO2: Analyze the time-domain performance of control systems.
CO3: Assess system stability using root locus and frequency response techniques.
CO4: Design controllers and compensators for dynamic systems.
CO5: Apply state-space analysis for multi-input and multi-output systems.

22. Business Economics & Financial Analysis

CO1: Understand economic concepts and their relevance to business decision-making.
CO2: Analyze demand, supply, and production functions in managerial contexts.
CO3: Explain cost analysis and its applications in production and pricing decisions.
CO4: Assess financial performance using balance sheets and profit and loss accounts.
CO5: Evaluate project proposals using capital budgeting techniques.

23. Electronic Measurements and Instrumentation

CO1: Understand the principles of measurement systems and identify errors in electronic measurements.
CO2: Analyze the operation of different analog and digital measuring instruments like voltmeters, ammeters, and multimeters.

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CO3: Design and evaluate bridge circuits for the measurement of resistance, capacitance, and inductance.
CO4: Examine the working principles of transducers and sensors for physical parameter measurements.
CO5: Explore data acquisition systems and analyze signal conditioning techniques used in modern instrumentation systems.

III Year II Semester

24. Antennas and Propagation

CO1: Analyze fundamental antenna parameters and radiation patterns.
CO2: Design and evaluate wire and aperture antennas.
CO3: Understand antenna arrays and their beamforming principles.
CO4: Analyze radio wave propagation mechanisms in different environments.
CO5: Explore modern antenna technologies like smart antennas and phased arrays.

25. Digital Signal Processing

CO1: Explain the representation and processing of discrete-time signals.
CO2: Perform Z-transform analysis for discrete-time systems.
CO3: Design FIR and IIR filters using standard techniques.
CO4: Implement DFT and FFT algorithms for signal analysis.
CO5: Explore DSP applications in communications and image processing.

26. VLSI Design

CO1: Understand CMOS technology and fabrication processes.
CO2: Analyze MOSFET characteristics and scaling issues.
CO3: Design combinational and sequential circuits using CMOS logic.
CO4: Explore FPGA architecture and VHDL programming for digital circuits.
CO5: Study low-power design techniques and emerging trends in VLSI.

27. Embedded System Design

CO1: Understand the architecture and components of embedded systems, including processors, memory, and peripherals.
CO2: Develop and debug embedded programs using assembly and high-level languages.
CO3: Interface sensors, actuators, and communication modules with microcontrollers for real-time applications.
CO4: Analyze embedded system design constraints, such as power consumption, timing, and resource optimization.
CO5: Explore operating systems for embedded platforms and apply real-time scheduling techniques in system design.

28. Non Conventional Sources of Energy

CO1: Understand the fundamental principles, importance, and potential of non-conventional energy sources, including solar, wind, geothermal, biomass, and tidal energy.
CO2: Analyze the working principles, design, and operation of solar energy systems, wind turbines, and other renewable energy technologies.
CO3: Evaluate the environmental and economic benefits of renewable energy sources and their impact on sustainable development.

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CO4: Develop skills to design and implement small-scale renewable energy systems for residential and industrial applications.
CO5: Assess the challenges and limitations in harnessing non-conventional energy sources and propose innovative solutions for effective energy utilization.

IV Year I Semester

29. Microwave and Optical Communications

CO1: Explain microwave waveguides, transmission lines, and impedance matching.
CO2: Design and analyze microwave components like couplers and isolators.
CO3: Understand optical fiber principles and light propagation mechanisms.
CO4: Evaluate the performance of optical transmitters and receivers.
CO5: Explore advanced optical communication technologies like WDM and OTDM.

30. Digital Image Processing

CO1: Understand the fundamental concepts of digital image representation, including pixels, color models, and image resolution.
CO2: Apply image enhancement techniques such as histogram equalization, contrast adjustment, and filtering in both spatial and frequency domains.
CO3: Perform image segmentation using thresholding, edge detection, and region-growing techniques.
CO4: Implement image compression algorithms like JPEG and PNG, and understand trade-offs between quality and compression ratio.
CO5: Explore advanced topics such as object recognition, image restoration, and morphological operations for various applications.

31. Biomedical Instrumentation

CO1: Understand the principles of various biomedical instruments and their applications in medical diagnostics.
CO2: Analyze and design bio-potential amplifiers for the measurement of physiological signals such as ECG, EEG, and EMG.
CO3: Explore the working principles of medical imaging techniques, including X-ray, CT, and MRI.
CO4: Design and analyze instruments used for patient monitoring, including heart rate monitors and respiratory devices.
CO5: Understand the role of sensors and transducers in biomedical instrumentation and their integration with medical devices for accurate diagnostics.

32. Professional Practice, Law & Ethics

CO1: Understand professional ethics and responsibilities in engineering.
CO2: Analyze case studies to identify ethical and legal conflicts in engineering projects.
CO3: Explain contract laws, intellectual property rights, and dispute resolution mechanisms.
CO4: Understand environmental ethics and sustainability in engineering practices.
CO5: Develop strategies for ethical decision-making in professional settings.

33. Java Programming

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CO1: Demonstrate a thorough understanding of the core concepts of Java, including object-oriented programming principles such as classes, objects, inheritance, polymorphism, and encapsulation.
CO2: Develop Java programs using control structures, arrays, strings, and exception handling to solve real-world problems efficiently.
CO3: Implement advanced Java features, such as multithreading, file handling, and input/output streams, to create robust and scalable applications.
CO4: Design and develop GUI-based applications using Java Swing, AWT, and event-handling mechanisms.
CO5: Utilize Java APIs and frameworks, such as Java Collections and JDBC, for database connectivity and efficient data manipulation.

IV Year II Semester

34. Satellite Communications

CO1: Explain satellite orbits, launching mechanisms, and transponders.
CO2: Analyze uplink and downlink design parameters for satellite communication.
CO3: Understand multiple access techniques like TDMA, FDMA, and CDMA.
CO4: Explore satellite-based navigation systems like GPS.
CO5: Evaluate modern applications of satellite communication in IoT and broadband systems.

35. System on Chip Architecture

CO1: Understand the basic concepts of System on Chip (SoC) design, including the integration of multiple components such as processors, memory, and peripherals.
CO2: Analyze different SoC architectures and evaluate their performance based on design goals like power consumption, processing speed, and resource utilization.
CO3: Design and implement SoC using hardware description languages (HDLs) such as VHDL or Verilog.
CO4: Explore the design and optimization of communication protocols and bus architectures within an SoC.
CO5: Apply testing methodologies for verifying SoC functionality, and understand the challenges in fabricating and validating SoC designs.

28. Non Conventional Sources of Energy

CO1: Understand the principles, significance, and classification of non-conventional energy sources, including solar, wind, biomass, geothermal, and tidal energy.
CO2: Analyze the working mechanisms and design considerations of various renewable energy technologies, such as photovoltaic systems, wind turbines, and biogas plants.
CO3: Evaluate the environmental, economic, and societal impacts of transitioning to non-conventional energy sources for sustainable development.
CO4: Apply technical knowledge to design, simulate, and optimize renewable energy systems for specific applications in residential, industrial, and agricultural sectors.
CO5: Identify challenges in harnessing non-conventional energy resources and propose innovative solutions to improve efficiency and reliability.

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R18 SYLLABUS, SEMESTER 1-1

MA101BS: MATHEMATICS – I

Course Outcomes: After learning the contents of this paper the student must be able to

CO1: Write the matrix representation of a set of linear equations and to analyse the solution of the system o equations

CO2: Find the Eigen values and Eigen vectors and Reduce the quadratic form to canonical form using orthogonal transformations.

CO3: Analyse the nature of sequence and series and Solve the applications on the mean value theorems.

CO4: Evaluate the improper integrals using Beta and Gamma functions

CO5: Find the extreme values of functions of two variables with/ without constraints.

CH102BS/CH202BS: CHEMISTRY

Course Outcomes: The basic concepts included in this course will help the student to gain:

CO1: The knowledge of atomic, molecular and electronic changes, band theory related to conductivity.

CO2: The required principles and concepts of electrochemistry, corrosion and in understanding the problem o water and its treatments.

CO3: The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.

CO4: The knowledge of configurational and conformational analysis of molecules and reaction mechanisms.

CO5: Understand the principles of battery technology in our day -today life.

EE103ES/EE203ES: BASIC ELECTRICAL ENGINEERING

Course Outcomes:

CO1: To analyze and solve electrical circuits using network laws and theorems.

CO2: To understand and analyze basic Electric and Magnetic circuits

CO3: To study the working principles of Electrical Machines

CO4: To introduce components of Low Voltage Electrical Installations

CO5: Explain the basic properties of electromagnetic circuit &their application.

EN105HS/EN205HS: ENGLISH

Course Outcomes: Students should be able to

CO1: Use English Language effectively in spoken and written forms.

CO2: Comprehend the given texts and respond appropriately.

CO3: Communicate confidently in various contexts and different cultures.

CO4: Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.

CO5: To conduct conversation practice: face to face and via media.

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R18 SYLLABUS, SEMESTER 1-2

MA201BS: MATHEMATICS – II

Course Outcomes: After learning the contents of this paper the student must be able to

CO1: Identify whether the given differential equation of first order is exact or not

CO2: Solve higher differential equation and apply the concept of differential equation to real world problems

CO3: Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelopiped

CO4: Evaluate the line, surface and volume integrals and converting them from one to another

CO5: TO evaluate partial derivatives and can implement to estimate maxima and minima of multivariable function.

AP102BS/AP202BS: APPLIED PHYSICS

Course Outcomes: Upon graduation:

CO1: The student would be able to learn the fundamental concepts on Quantum behaviour of matter in its micro state.

CO2: The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fibre optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.

CO3: Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.

CO4: The course also helps the students to be exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials.

CO5: Explain fundamentals of quantum mechanics and apply to one dimensional motion of particles

CS103ES/CS203ES: PROGRAMMING FOR PROBLEM SOLVING

Course Outcomes: The student will learn

CO1: To write algorithms and to draw flowcharts for solving problems.

CO2: To convert the algorithms/flowcharts to C programs.

CO3: To decompose a problem into functions and to develop modular reusable code.

CO4: To use arrays, pointers, strings and structures to write C programs.

CO5: Searching and sorting problems.

ME104ES/ME204ES: ENGINEERING GRAPHICS

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

CO1: Students will be able to know about different types of lines & use of different types of pencils in engineering drawing.

CO2: Student's ability to hand letter will improve.

CO3: Student's ability to perform basic sketching techniques will improve.

CO4: Students are able to know different angle of projection& orthographic projection

CO5: Students will able to gain knowledge on plane, solids like pyramid, frustrum etc.

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R18 SYLLABUS, SEMESTER 2-1

EE301ES: ENGINEERING MECHANICS

Course Outcomes: At the end of the course, students will be able to

CO1: Determine resultant of forces acting on a body and analyse equilibrium of a body subjected to a system of forces.

CO2: Solve problem of bodies subjected to friction.

CO3: Find the location of centroid and calculate moment of inertia of a given section.

CO4: Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion.

CO5: Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration.

EE302PC: ELECTRICAL CIRCUIT ANALYSIS

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

CO1: Apply network theorems for the analysis of electrical circuits.

CO2: Obtain the transient and steady-state response of electrical circuits.

CO3: Analyze circuits in the sinusoidal steady-state (single-phase and three-phase).

CO4: Analyze two port circuit behavior.

CO5: compute Fourier series for complex waveforms.

EE303PC: ANALOG ELECTRONICS

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

CO1: Know the characteristics, utilization of various components.

CO2: Understand the biasing techniques

CO3: Design and analyze various rectifiers, small signal amplifier circuits.

CO4: Design sinusoidal and non-sinusoidal oscillators.

CO5: A thorough understanding, functioning of OP-AMP, design OP-AMP based circuits with linear integrated circuits.

EE304PC: ELECTRICAL MACHINES – I

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

CO1: Identify different parts of a DC machine & understand its operation

CO2: Carry out different testing methods to predetermine the efficiency of DC machines

CO3: Understand different excitation and starting methods of DC machines

CO4: Control the voltage and speed of a DC machines

CO5: Analyze single phase and three phase transformers circuits.

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EE305PC: ELECTROMAGNETIC FIELDS

Course Outcomes: At the end of the course, students will demonstrate the ability

CO1: To understand the basic laws of electromagnetism.

CO2: To obtain the electric and magnetic fields for simple configurations under static conditions.

CO3: To analyze time varying electric and magnetic fields.

CO4: To understand Maxwell's equation in different forms and different media.

CO5: To understand the propagation of EM waves.

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R18 SYLLABUS, SEMESTER 2-2

MA401BS: LAPLACE TRANSFORMS, NUMERICAL METHODS AND COMPLEX VARIABLES

Course Outcomes: After learning the contents of this paper the student must be able to

CO1: Use the Laplace transforms techniques for solving ODE's

CO2: Estimate the value for the given data using interpolation

CO3: Find the numerical solutions for a given ODE's

CO4: Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems

CO5: Taylor's and Laurent's series expansions of complex function

EE402PC: ELECTRICAL MACHINES – II

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

CO1: Understand the concepts of rotating magnetic fields.

CO2: Understand the operation of ac machines.

CO3: learn the process of 'synchronisation' of a generator to the live bus bar and method of starting a synchronous motor.

CO4: Analyze performance characteristics of ac machines.

CO5: Learn methods for testing of different electrical machines so as to identify their applicability in different practical situations.

EE403PC: DIGITAL ELECTRONICS

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

CO1: Understand working of logic families and logic gates.

CO2: Design and implement Combinational and Sequential logic circuits.

CO3: Understand the process of Analog to Digital conversion and Digital to Analog conversion.

CO4: Be able to use PLDs to implement the given logical problem.

CO5: Explain the memory system and develop the designating process of different memory.

EE404PC: CONTROL SYSTEMS

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

CO1: Understand the modeling of linear-time-invariant systems using transfer function and state- space representations.

CO2: Analyze system response and evaluate error dynamics in time domain.

CO3: Understand the concept of stability and its assessment for linear-time invariant systems.

CO4: Design simple feedback controllers.

CO5: Understand the general concept of a system and classify systems into different types

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EE405PC: POWER SYSTEM – I

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

CO1: Understand the concepts of power systems.

CO2: Understand the operation of conventional generating stations and renewable sources of electrical power.

CO3: Evaluate the power tariff methods.

CO4: Determine the electrical circuit parameters of transmission lines

CO5: Understand the layout of substation and underground cables and corona.

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R18 SYLLABUS, SEMESTER 3-1

EE501PE: POWER ELECTRONICS

Course Outcomes: At the end of this course students will demonstrate the ability to

CO1: Understand the differences between signal level and power level devices.

CO2: Analyze controlled rectifier circuits.

CO3: Analyze the operation of DC-DC choppers.

CO4: Analyze the operation of voltage source inverters.

CO5: Apply research-based knowledge for design of DC-DC converter and inverter

EE502PE: POWER SYSTEM – II

Course Outcomes:

CO1: Analyze transmission line performance.

CO2: Apply load compensation techniques to control reactive power

CO3: Understand the application of per unit quantities.

CO4: Design over voltage protection and insulation coordination

CO5: Determine the fault currents for symmetrical and unbalanced faults.

EE503PE: MEASUREMENTS AND INSTRUMENTATION

Course Outcomes: After completion of this course, the student able to

CO1: Understand different types of measuring instruments, their construction, operation and

CO2: characteristics

CO3: Identify the instruments suitable for typical measurements

CO4: Apply the knowledge about transducers and instrument transformers to use them effectively.

CO5: Apply the knowledge of smart and digital metering for industrial applications

EE512PE: HIGH VOLTAGE ENGINEERING

Course outcomes: At the end of the course, the student will demonstrate

CO1: Understand the basic physics related to various breakdown processes in solid, liquid and

CO2: gaseous insulating materials.

CO3: Knowledge of generation and measurement of D. C., A.C., & Impulse voltages.

CO4: Knowledge of tests on H. V. equipment and on insulating materials, as per the standards.

CO5: Knowledge of how over-voltages arise in a power system, and protection against these over voltages.

SM504MS: BUSINESS ECONOMICS AND FINANCIAL ANALYSIS

Course Outcome:

CO1: Understand the elasticity of the demand of the product, different types, and measurement of elasticity o demand and factors influencing on elasticity of demand.

CO2: Recognize the Production function, features of Iso-Quants and Iso-Costs, different types of interna economies, external economies and law of returns with appropriate examples.

CO3: Illustrate the features, merits and demerits of different forms of business organizations existing in the modern business.

CO4: Enumerate the concept of capital budgeting and allocations of the resources through capital budgetin methods and compute simple problems for project management.

CO5: Evaluate different types of financial ratios for knowing liquidity and profitability positions of busines concern.

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R18 SYLLABUS, SEMESTER 3-2

EE612PE: POWER SEMICONDUCTOR DRIVES

Course Outcomes: After completion of this course the student is able to

CO1: Identify the drawbacks of speed control of motor by conventional methods.
CO2: Differentiate Phase controlled and chopper-controlled DC drives speed-torque characteristics merits and demerits
CO3: Understand Ac motor drive speed–torque characteristics using different control strategies its merits and demerits
CO4: Describe Slip power recovery schemes
CO5: Analysis of close loop control of dc motor

EE601PC: SIGNALS AND SYSTEMS

Course Outcomes: Upon completing this course, the student will be able to

CO1: Differentiate various signal functions.
CO2: Represent any arbitrary signal in time and frequency domain.
CO3: Understand the characteristics of linear time invariant systems.
CO4: Analyze the signals with different transform technique
CO5: Apply transform techniques to analyze continuous-time and discrete-time signals and systems

EE602PC: MICROPROCESSORS & MICROCONTROLLERS

Course Outcomes: Upon completing this course, the student will be able to

CO1: Understands the internal architecture, organization and assembly language programming of 8086 processors.
CO2: Understands the internal architecture, organization and assembly language programming of 8051/controllers
CO3: Understands the interfacing techniques to 8086 and 8051 based systems.
CO4: Understands the internal architecture of ARM processors and basic concepts of advanced ARM processors.
CO5: Develop simple programs using addressing modes and instruction set

EE603PC: POWER SYSTEM PROTECTION

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

CO1: Compare and contrast electromagnetic, static and microprocessor-based relays
CO2: Apply technology to protect power system components.
CO3: Select relay settings of over current and distance relays.
CO4: Analyze quenching mechanisms used in air, oil and vacuum circuit breakers.
CO5: Explain protection of power system and its components

EE604PC: POWER SYSTEM OPERATION AND CONTROL

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

CO1: Understand operation and control of power systems.
CO2: Analyze various functions of Energy Management System (EMS) functions.
CO3: Analyze whether the machine is in stable or unstable position.
CO4: Understand power system deregulation and restructuring
CO5: Classification of substations, concept of neutral grounding and voltage control method

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MT601OE: NON-CONVENTIONAL ENERGY SOURCES

CO1: Demonstrate the generation of electricity from various Non-Conventional sources of energy, have a working knowledge on types of fuel cells.

CO2: Estimate the solar energy, Utilization of it, Principles involved in solar energy collection and conversion of it to electricity generation.

CO3: Explore the concepts involved in wind energy conversion system by studying its components, types and performance.

CO4: Illustrate ocean energy and explain the operational methods of their utilization.

CO5: Acquire the knowledge on Geothermal energy.

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R18 SYLLABUS, SEMESTER 4-1

EE713PE: ELECTRICAL AND HYBRID VEHICLES

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

CO1: Understand the models to describe hybrid vehicles and their performance.
CO2: Understand the different possible ways of energy storage.
CO3: Understand the different strategies related to energy storage systems.
CO4: Compare various energy storage and EV charging systems.
CO5: Select drive systems and various communication protocols for EV

EE721PE: HVDC TRANSMISSION

Course Outcomes: After completion of this course the student is able to

CO1: Compare EHV AC and HVDC system and to describe various types of DC links
CO2: Analyze Graetz circuit for rectifier and inverter mode of operation
CO3: Describe various methods for the control of HVDC systems and to perform power flow analysis in AC/DC systems
CO4: Describe various protection methods for HVDC systems and classify Harmonics and design different types of filters
CO5: Demonstrate the implementation benefits of HVDC transmission over EHVAC transmission with respect to economics, performance and technological developments from LCC to VSC based systems.

SM701MS: FUNDAMENTALS OF MANAGEMENT FOR ENGINEERS

Course Outcome:

CO1: What are the circumstances that lead to management evolution and how it will affect future managers
CO2: Analyze and evaluate the influence of historical forces on the current practice of management
CO3: Identify and evaluate social responsibility and ethical issues involved in business situations and logically articulate own position on such issues.
CO4: Explain how organizations adapt to an uncertain environment and identify techniques managers use to influence and control the internal environment.
CO5: Develop the process of management's four functions: planning, organizing, leading, and controlling.

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Electronic Sensors
R18 SYLLABUS, SEMESTER 4-2

EE811PE: POWER QUALITY AND FACTS (PE - V)

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

CO1: Know the severity of power quality problems in distribution system.
CO2: Understand the concept of voltage sag transformation from up-stream (higher voltages) to down-stream (lower voltage)
CO3: Choose proper controller for the specific application based on system requirements
CO4:Understand various systems thoroughly and their requirements.
CO5: Understand the control circuits of Shunt Controllers SVC & STATCOM for various functions viz.

EE822PE: ELECTRICAL DISTRIBUTION SYSTEMS

Course Outcomes: After completion of this course, the student able to

CO1: Distinguish between transmission, and distribution line and design the feeders
CO2: Compute power loss and voltage drop of the feeders
CO3: Design protection of distribution systems
CO4: Understand the importance of voltage control and power factor improvement.
CO5: Apply various protective devices and its coordination techniques to distribution system

MEASURING INSTRUMENTS

Course Outcomes: After Completion of the course the student is able to

CO1: Able to identify suitable sensors and transducers for real time applications.
CO2: Able to translate theoretical concepts into working models.
CO3: Able to understand the basic of measuring device and use them in relevant situation.
CO4: To introduce students a knowledge to use modern tools necessary for electrical projects.
CO5: To understand students how different types of meters work and their construction

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