Department of Electrical Engineering
Course Outcomes (CO)
Semester III

3EE201PC1 Network Analysis

3EE201PC1.1 Determine the basic circuit elements and their interconnections to develop foundational knowledge and skills in electrical circuit behaviour.
EE201PC1.2
Evaluate the transient response of electrical circuits using Laplace transform methods to gain essential skills in dynamic circuit analysis.
3EE201PC1.3
Demonstrate the application of mesh current and node voltage methods to analyse electrical circuits and develop practical skills in systematic circuit evaluation.
3EE201PC1.4
Analyse electrical circuits using network simplification theorems to ensure accurate evaluation and effective interpretation of circuit behaviour.
3EE201PC1.5
Solve circuit problems using concepts of electric network topology to strengthen analytical skills in circuit interpretation.
3EE201PC1.6
Evaluate various network functions and examine two-port network behaviour to build foundational understanding of advanced circuit characteristics.

3EE202PC1 Electronic Devices & Circuits

3EE202PC1.1
Apply the fundamentals of semiconductor physics to analyse the V–I characteristics of Diodes and Zener regulators, enabling correct selection and use in voltage regulation applications
3EE202PC1.2
Design and analyse diode-based circuits such as half-wave/full-wave rectifiers and simple filters to develop the ability to create basic DC power supply systems.
3EE202PC1.3
Determine the construction and operation of BJTs and UJTs and calculate suitable DC biasing and stability factors to ensure reliable and predictable transistor operation.
3EE202PC1.4
Analyse power amplifiers and oscillator circuits by evaluating their power gain, efficiency, and distortion.
3EE202PC1.5
Apply the operational principles and structural characteristics of JFETs and MOSFETs to determine appropriate biasing methods and utilize them in switching and voltage-control applications.
3EE202PC1.6

Apply the principles and characteristics of Special Diodes to appropriately select and use them in specialized electronic circuit applications.

3EE203PC1 Electrical Machines- I

3EE203PC1.1
Explain construction, operation, EMF, torque, windings, and commutation to analyze rotating machine performance.
3EE203PC1.2
Classify DC generators, analyze characteristics, applications, parallel operation, and testing for efficient system use.
3EE203PC1.3
Analyze types, characteristics, starting methods, speed control, braking techniques, losses, efficiency, and testing of D.C. motors to apply them effectively in controlled motion and industrial drive applications.
3EE203PC1.4
Explain transformer construction, operation, losses, equivalent circuit, and tests to evaluate performance.
3EE203PC1.5
Compare autotransformers with two-winding transformers, derive voltage and current ratios, calculate copper savings, and analyze construction, operation, advantages, limitations, and applications to assess their economic and practical use in electrical systems.
3EE203PC1.6
Analyze construction, working, types, connections, vector groups, open-delta operation, and testing of three-phase transformers to ensure proper selection, connection, and performance evaluation in power and distribution systems.

3EE204MD1 Electrical Energy Generation

3EE204MD1.1
Classify energy sources and explain working principles of various power plants to recognize their role in meeting electricity demand.
3EE204MD1.2
Explain the layout, components, and operation of thermal, hydro, and nuclear power plants to assess their performance and suitability for power generation.
3EE204MD1.3
Describe biomass, solar, and wind energy systems and their working principles to apply renewable energy technologies for sustainable power generation.

3SH205OE1 Soft Skills & Profile Building

3SH205OE1.1
Apply advanced interpersonal, analytical, and persuasive communication techniques in professional contexts for effective professional interactions.
3SH205OE1.2
Demonstrate professional workplace etiquette, business communication, and group discussion skills to enhance employability.
3SH205OE1.3
Analyze leadership styles, emotional intelligence, and team dynamics for effective collaboration.
3SH205OE1.4
Design a structured and realistic career plan aligned with industry expectations and personal goals for professional growth.
3SH205OE1.5
Create ATS-friendly résumés, professional portfolios, and digital profiles for personal branding.
3SH205OE1.6
Perform effectively in interviews, workplace simulations, and job-search processes with professional confidence for enhanced employability.

3SH205OE2 Team Building & Management

3SH205OE2.1
Explain the principles and importance of effective team building in organizations to foster collaborative work culture.
3SH205OE2.2
Apply team dynamics and collaboration strategies to achieve common goals.
3SH205OE2.3
Analyze leadership styles and managerial roles for effective team performance.
3SH205OE2.4
Demonstrate conflict resolution, negotiation, and interpersonal management skills for effective team performance.
3SH205OE2.5
Apply motivation and performance management techniques in team-based environments for achieving organizational goals.
3SH205OE2.6
Perform effectively as a team member or leader in simulated managerial scenarios to develop leadership competencies.

3EE206PC1 Network Analysis - Lab

3EE206PC1.1

Demonstrate experimental skills in using mesh, nodal, and network theorems to analyse DC and AC circuits, enhancing both theoretical understanding and practical competency.

3EE206PC1.2

Analyse, interpret, and validate experimental results of electrical networks.

3EE206PC1.3

Participate collaboratively in planning, executing, and presenting practical skills in electrical circuit design and testing.

3EE207PC1 Electronic Devices & Circuits – Lab

3EE207PC1.1

Apply the fundamentals of semiconductor physics to analyse the V-I characteristics and function of Diodes and Zener regulators.

3EE207PC1.2

Design and analyse basic diode circuits like half-wave, full-wave rectifiers, and simple section filters for DC power supply applications.

3EE207PC1.3

Explain the construction and operation of BJTs and UJT, and determine appropriate DC biasing circuits and stability factors for transistor operation.

3EE208PC1 Electrical Machines-I – Lab

3EE208PC1.1

Perform tests on DC machines and transformers to determine characteristics and improve understanding of machine performance.

3EE208PC1.2

Apply OCC, load tests, braking, polarity, ratio, and OC/SC methods to analyze machines for effective operation.

3EE208PC1.3

Interpret experimental results to validate theoretical concepts and enhance the ability to assess machine behavior.

3EE209EM1 Economics of Energy Markets

3EE209EM1.1

Apply fundamental power sector cost metrics and load definitions to construct accurate power flow models and bid strategies.

3EE209EM1.2

Analyze the Indian tariff structure and billing components to defend opinions on regulatory fairness and cross-subsidization policies.

3EE209EM1.3
Evaluate global energy trends and emerging technologies to justify the economic and ethical adoption of sustainable solutions like EVs.

3SH210VE1 Constitutional Values and Fundamental Duties

3SH210VE1.1
Explain the historical background, making, and significance of the Indian Constitution to Understand the Constitution, Preamble, and core values.
3SH210VE1.2
Interpret Fundamental Rights and Duties (Articles 12–35, 51A) to evaluate their implications through case studies in professional and civic life.
3SH210VE1.3
Apply constitutional principles to engineering ethics, sustainability concerns (Articles 48A, 51A(g)), and demonstrate social commitment, innovation, and inclusive growth as nation builders.

3EE400FP1 Field Project

3EE400FP1.1
Conduct field-based surveys and assessments to identify electrical, renewable energy, and power quality issues.
3EE400FP1.2
Apply electrical engineering principles to design and implement practical, safe, and low-cost solutions for community needs.
3EE400FP1.3
Execute performance evaluation and energy auditing to improve efficiency, reduce losses, and assess societal impact.

3AL001NC1 Disaster Management and Preparedness

3CE001NC1.1
Identify the concepts of disaster, hazard, vulnerability and risk, and classify disasters to understand the basic nature, causes and profiles of disasters in India.
3CE001NC1.2
Analyze the disaster management cycle for risk assessment, mitigation, preparedness, response, recovery, and international disaster management frameworks.
3CE001NC1.3
Apply disaster management practices, including stakeholder roles, national policies, engineers' responsibilities, and preparedness measures for effective disaster risk reduction.

3EE211DH1 Futuristic Power Systems

3EE211DH1.1
Explain the present global scenario of electricity generation, transmission, and distribution, and understand the need for resilient and secure energy infrastructure to address social, technical, and economic challenges in modern power systems.
3EE211DH1.2
Analyze various renewable energy resources and technologies, and evaluate their role in reducing dependence on conventional energy sources and promoting sustainable power generation.
3EE211DH1.3
Interpret the concepts and challenges of renewable energy integration, including hybrid systems and forecasting, to ensure reliable, stable, and efficient large-scale power system operation.
3EE211DH1.4
Compare different energy storage technologies and their characteristics, and assess their role in enhancing grid stability, reliability, and continuity of renewable energy supply.
3EE211DH1.5
Describe smart grid and microgrid concepts, architectures, and control strategies, and understand their significance in enabling intelligent, flexible, and decentralized power systems.
3EE211DH1.6
Examine microgrid implementation in India through rural electrification and case studies, and evaluate their contribution to achieving inclusive, reliable, and sustainable energy access considering technical, economic, and social factors.

3EE211DH2 Fundamentals of EVs: Technology & Economics

3EE211DH2.1
Explain the evolution of electric vehicles, including early developments, comparison with ICE vehicles, and technological advancements, to understand the transition toward sustainable and energy-efficient transportation systems.
3EE211DH2.2
Describe the fundamentals of electric vehicles, their types, electric machines, and transmission systems to develop foundational knowledge of EV architecture and current technological trends.
3EE211DH2.3
Analyze hybrid electric vehicle configurations, operating modes, and degrees of hybridization to understand their role in improving fuel efficiency and reducing emissions in modern transportation.
3EE211DH2.4

Interpret EV powertrain components, motor selection, transmission systems, and regenerative braking to understand performance characteristics and design considerations of efficient propulsion systems.

3EE211DH2.5

Examine global and Indian EV scenarios, including adoption trends, key players, and policies to understand market dynamics and regulatory frameworks influencing EV growth.

3EE211DH2.6

Evaluate environmental, economic aspects, and challenges of EV adoption to understand sustainability benefits, cost implications, and barriers affecting large-scale implementation of electric mobility.

Semester IV

4EE212PC1 Analog and Digital Circuits

4EE212PC1.1

Apply knowledge of operational amplifiers and their internal circuits to analyze IC-based circuits and measure op-amp parameters.

4EE212PC1.2

Design and analyze operational amplifier (Op-Amp) circuits for practical applications like summing, integrating, and filtering.

4EE212PC1.3

Illustrate the concepts of linear ICs, SMPS, and IC 555 to analyze and implement regulator and timer-based electronic circuits.

4EE212PC1.4

Use Boolean algebra and Karnaugh Maps (K-Maps) to simplify and implement combinational logic circuits.

4EE212PC1.5

Demonstrate the operation of sequential logic circuits, including flip-flops, counters, and registers.

4EE212PC1.6

Evaluate the principles and architecture of Analog-to-Digital (ADC) and Digital-to-Analog (DAC) converters to understand the concept of ADC and DAC.

4EE213PC1 Electrical Measurement & Instrumentation

4EE213PC1.1

Classify suitable measuring instruments (PMMC, MI, Electrodynamometer, Induction types) to select the correct device for accurate practical electrical measurements.

4EE213PC1.2

Demonstrate the construction, working principle, and torque equation of wattmeters and energy meters to understand their operation and ensure correct power and energy measurement.

4EE213PC1.3

Demonstrate the construction and working of Instrument Transformers and special purpose meters to ensure safe, isolated, and precise measurement in high-voltage and specialized applications.

4EE213PC1.4

Analyze AC/DC bridge techniques for measuring resistance, inductance, and capacitance to apply accurate testing methods in practical laboratory scenarios.

4EE213PC1.5

Demonstrate digital measuring instruments to achieve accurate, fast, and real-time electrical measurement in modern applications.

4EE213PC1.6

Illustrate instrumentation systems and transducers to understand how physical parameters are sensed, measured, and controlled in practical engineering systems.

4EE214PC1 Power Systems – I

4EE214PC1.1

Examine the structure and standards of modern power systems to explain the role of smart grids and microgrids.

4EE214PC1.2

Analyse transmission line inductance and capacitance to evaluate effects of conductor configuration and earth return.

4EE214PC1.3

Determine ABCD constants and assess voltage regulation, efficiency, and SIL to evaluate transmission line performance.

4EE214PC1.4

Apply sag–tension, loading, corona, and insulator concepts to ensure reliable and safe overhead line design.

4EE214PC1.5

Explain construction, insulation, and dielectric stress for analysing performance and suitability of different underground cable types.

4EE214PC1.6

Use per-unit representation and Y-Bus formation to analyse distribution networks and basic load-flow behaviour.

4EE215MD2 Renewable Energy Systems

4EE215MD2.1

Classify energy sources and analyze global energy trends to understand the need for renewable energy and sustainable development.

4EE215MD2.2

Explain the working and components of geothermal and tidal power plants to evaluate their feasibility and applications.

4EE215MD2.3

Explain the working principles, components, types and policies of hydrogen fuel, solar, and wind power systems to evaluate their role in sustainable and clean power generation.

4SH216OE1 Quantitative and Logical Reasoning

4SH216OE1.1

Apply arithmetic and numerical techniques to solve quantitative problems accurately.

4SH216OE1.2

Solve algebraic and equation-based problems using simplification and approximation methods to improve problem-solving efficiency.

4SH216OE1.3

Analyze logical reasoning problems using structured and critical thinking approaches to improve decision-making skills.

4SH216OE1.4

Interpret and analyze data using graphical and tabular methods for decision making for strategic planning.

4SH216OE1.5

Solve complex logical puzzles and advanced reasoning problems efficiently for competitive examination success.

4SH216OE1.6

Demonstrate effective aptitude test strategies integrating quantitative and logical reasoning skills for career advancement opportunities.

4SH216OE2 Critical Thinking & Decision Making

4SH216OE2.1

Apply critical thinking frameworks to analyze problems systematically.

4SH216OE2.2

Evaluate information, assumptions, and arguments for logical consistency and validity.

4SH216OE2.3

Analyze complex situations and identify feasible alternatives for decision making.

4SH216OE2.4

Design rational and ethical decision-making strategies under uncertainty to ensure sustainable organizational outcomes.

4SH216OE2.5

Apply quantitative and qualitative tools to support decision-making processes.

4SH216OE2.6

Demonstrate effective decision making in simulated professional and team-based scenarios to resolve workplace challenges effectively.

4EE217PC1 Electrical Measurement & Instrumentation Lab

4EE217PC1.1

Demonstrate the working principles and characteristics of various electrical measuring instruments and transducers used for measurement of electrical and physical quantities.

4EE217PC1.2

Perform accurate measurement of resistance, inductance, power, energy, pressure, force, displacement, and speed using appropriate bridges and electronic instruments.

4EE217PC1.3

Analyze experimental data, identify possible sources of error, and interpret measurement results to ensure reliability and precision in practical applications.

4EE218PC1 Power Systems – I Lab

4EE218PC1.1

Analyse short and medium transmission line performance using ABCD parameters and Ferranti effect to understand power transfer behaviour.

4EE218PC1.2

Simulate insulators, overhead lines, and cables using utility software to compare characteristics and suitability under varying operating conditions.

4EE218PC1.3

Interpret distribution configurations and load flow results using software to understand system behaviour and enhance network operational efficiency.

4EE219VS1 Electrical CAD

4EE219VS1.1

Apply project management principles and file standards to initialize and organize multi-sheet electrical design projects.

4EE219VS1.2

Design professional electrical schematics and panel layouts using modern CAD automation tools and industry symbol libraries.

4EE219VS1.3

Generate and verify fabrication documentation (BOM, Wire Lists) adhering to professional ethics and engineering standards.

4SH220AE1 Technical Writing

4SH220AE1.1

Apply principles of technical writing in engineering documents.

4SH220AE1.2

Apply technical writing skills to prepare professional documents.

4SH220AE1.3

Create ethical, well-structured technical and research documents using IEEE referencing for professional and academic communication.

4SH221EM1 Fundamentals of Book Keeping and Accounting

4SH221EM1.1

Apply basic principles of bookkeeping and accounting for recording and maintaining financial transactions accurately.

4SH221EM1.2

Analyze financial statements such as income statement, balance sheet, and cash flow statement for supporting financial understanding and business decision-making.

4SH221EM1.3

Apply accounting tools and techniques for evaluating financial performance and improving business efficiency.

4CE222VE1 Environmental Science

4CE222VE1.1

Analyze renewable and non-renewable natural resources and associated problems to promote sustainable utilization for future generations.

4CE222VE1.2

Analyze food chains, webs, and ecological pyramids to evaluate ecological interactions and succession processes.

4CE222VE1.3

Examine shift from unsustainable to sustainable development to promote responsible resource planning for society.

4EE223DH1 Microgrid Engineering

4EE223DH2.1

Explain the fundamentals of conventional power systems and the need for transitioning to smart grid technologies to understand the limitations of existing grids and the motivation for modernization.

4EE223DH2.2

Describe the architecture, components, and key technologies used in smart grid systems to gain insight into their structure and functional operation.

4EE223DH2.3

Identify and compare communication technologies and standards used for smart grid data exchange and monitoring to ensure effective and reliable information flow within the grid.

4EE223DH2.4

Analyze the integration of distributed energy resources and microgrids within the smart grid framework to support efficient and sustainable energy utilization.

4EE223DH2.5

Apply basic concepts of demand-side management, demand response, and energy management in smart grid operation to improve energy efficiency and load management.

4EE223DH2.6

Discuss applications, cybersecurity concerns, and emerging trends in smart grid technologies at national and global levels to understand future challenges and advancements in power systems.

4EE223DH2 Automotive Engineering and Electric Vehicle Systems

4EE223DH2.1

Explain the evolution, configuration, and structural aspects of automobiles, including body, chassis, and materials, to understand their influence on vehicle design, performance, safety, and durability.

4EE223DH2.2

Analyze automotive powertrains, suspension, steering, NVH, and various drive configurations (FWD, RWD, AWD, 4WD), to evaluate vehicle motion, ride comfort, and drivability characteristics.

4EE223DH2.3

Describe and compare transmission systems (MT, AT, AMT, CVT), including gear mechanisms, clutch operation, and power flow, to understand torque transmission, gear ratio selection, and efficiency optimization.

4EE223DH2.4

Evaluate automotive subsystems such as aerodynamics, braking, tyres, and instrumentation, to assess their impact on vehicle handling, stability, safety, and energy efficiency.

4EE223DH2.5

Explain the operation and control of electric machines (DC, IM, PMSM, BLDC) and auxiliary electrical systems, to understand electric propulsion and support systems in modern EVs.

4EE223DH2.6

Analyze battery technologies, charging systems, and automotive sensors (including MEMS), to understand energy management, safety, and intelligent monitoring in electric vehicles.

5EE224EC1 Solar Panel Design and Implementation

5E2224EC1.1
Apply principles of solar energy conversion and PV effect to analyse photovoltaic operation.
5E2224EC1.2
Identify balance of System components to choose appropriate devices like batteries, charge controllers, and inverters and solar system sizing.
5E2224EC1.3
Analyse site assessment and feasibility to determine suitability for solar PV installation.

5EE225EC1 Repairing and Maintenance of Electrical Machines

5EE225EC1.1
Describe the construction, components, and essential testing methods of electrical machines to evaluate their condition and performance in practical applications.
5EE225EC1.2
Apply the knowledge of electrical machines to solve basic maintenance and repair issues.
5EE225EC1.3
Analyse the operational parameters of electrical machines to evaluate their performance under different conditions.