



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

CRITERION 3	Course Outcomes and Program Outcomes	120
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3. COURSE OUTCOMES AND PROGRAM OUTCOMES (120)

3.1. The correlation between the courses and the Program Outcomes (POs) and Program Specific Outcomes (PSOs) (20)

(Program Outcomes as mentioned in Annexure I and Program Specific Outcomes as defined by the Program)

3.1.1. Course Outcomes (COs) (SAR should include course outcomes of one course from each semester of study, however, should be prepared for all courses and made available as evidence, if asked) (05)

Course Name: Ciii Year of Study: YYYY – YY; for ex. C201 Year of study 2022-23

Course Name: - Elements of Electrical Engineering

Subject Code: - 21EME15/25, C101, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21EE15.1	C101.1	Understand basic concepts of mechanical engineering in the fields of energy and its utilization, materials technology, manufacturing techniques, and transmission systems through demonstrations.
21EE15.2	C101.2	Understand the application of energy sources in Power generation and utilization, Engineering materials, manufacturing, and machining techniques leading to the latest advancements and transmission systems in day to day activities
21EE15.3	C101.3	Apply the skills in developing simple mechanical elements and processes

Course Name: - Basic Electrical Engineering

Subject Code: - 21EE13/23, C102, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21EVN15.1	C102.1	Obtain the output characteristics of clipper and clamper circuits.
21EVN15.2	C102.2	Design and compare biasing circuits for transistor amplifiers & explain the transistor switching.
21EVN15.3	C102.3	Explain the concept of feedback, its types and design of feedback circuits
21EVN15.4	C102.4	Design and analyse the power amplifier circuits and oscillators for different frequencies.
21EVN15.5	C102.5	Design and analysis of FET and MOSFET amplifiers.



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Course Name: - Transform Calculus, Fourier series And Numerical Techniques

Subject Code: - 21MAT31, C201, Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21MAT31.1	C201.1	To solve ordinary differential equations using Laplace transform.
21MAT31.2	C201.2	Demonstrate the Fourier series to study the behaviour of periodic functions and their communications, digital signal processing and field theory.
21MAT31.3	C201.3	To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations
21MAT31.4	C201.4	To solve mathematical models represented by initial or boundary value problems involving partial differential equations
21MAT31.5	C201.5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

Course Name: Analog Electronic Circuits and Op - Amps

Subject Code: - 21EE32, C202 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21EE32.1	C202.1	Obtain the output characteristics of clipper and clamper circuits.
21EE32.2	C202.2	Design and compare biasing circuits for transistor amplifiers & explain the transistor switching.
21EE32.3	C202.3	Explain the concept of feedback, its types and design of feedback circuits
21EE32.4	C202.4	Design and analyse the power amplifier circuits and oscillators for different frequencies.
21EE32.5	C202.5	Design and analysis of FET and MOSFET amplifiers.
21EE32.6	C202.6	Demonstrate the application of Op-amps.

Course Name: Electric Circuit Analysis

Subject Code: - 21EE33, C203 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21EE33.1	C203.1	Understand the basic concepts, basic laws and methods of analysis of DC and AC networks and reduce the complexity of network using



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		source shifting, source transformation and network reduction using transformations.
21EE33.2	C203.2	Solve complex electric circuits using network theorems.
21EE33.3	C203.3	Discuss resonance in series and parallel circuits and also the importance of initial conditions and their evaluation.
21EE33.4	C203.4	Synthesize typical waveforms using Laplace transformation.
21EE33.5	C203.5	Solve unbalanced three phase systems and also evaluate the performance of two port networks.

Course Name: Transformers and Generators

Subject Code: - 21EE34, C204 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21EE34.1	C204.1	Understand the construction and operation of 1-phase, 3-Phase transformers, and Autotransformer.
21EE34.2	C204.2	Analyze the performance of transformers by polarity test, Sumpner's Test, phase conversion, 3-phase connection, and parallel operation
21EE34.3	C204.3	Understand the construction and working of AC and DC Generators
21EE34.4	C204.4	Analyze the performance of the AC Generators on infinite bus and parallel operation.
21EE34.5	C204.5	Determine the regulation of AC Generator by Slip test, EMF, MMF, and ZPF Methods.

Course Name: Electrical Machines Laboratory -1

Subject Code: - 21EEL35, C205 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21EEL35.1	C205.1	Evaluate the performance of transformers from the test data obtained.
21EEL35.2	C205.2	Connect and operate two single phase transformers of different KVA rating in parallel.
21EEL35.3	C205.3	Connect single phase transformers for three phase operation and phase conversion.
21EEL35.4	C205.4	Compute the voltage regulation of synchronous generator using the test data obtained in the laboratory.



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21EEL35.5	C205.5	Evaluate the performance of synchronous generators from the test data and assess the performance of synchronous generator connected to infinite bus.
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Course Name: Social Connect and Responsibility

Subject Code: - 21SCR36, C206 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21SCR36.1	C206.1	Understand social responsibility
21SCR36.2	C206.2	Practice sustainability and creativity
21SCR36.3	C206.3	Showcase planning and organizational skills

Course Name: Samskrutika Kannada

Subject Code: - 21KSK37, C207 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21KSK37.1	C207.1	Students will understand the Kannada language, culture, and the importance of Kannada identity and heritage.
21KSK37.2	C207.2	Students will gain knowledge about Kannada literature, folklore, and various art forms, and appreciate their cultural and aesthetic values.
21KSK37.3	C207.3	Students will gain a technical familiarity.
21KSK37.4	C207.4	Students will understand the social, cultural, and ethical values embedded in classical and modern Kannada literature.

Course Name: Balake Kannada

Subject Code: - 21KBK37, C208 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21KBK37.1	C208.1	To understand the necessity of learning of local language for comfortable life.
21KBK37.2	C208.2	To Listen and understand the Kannada language properly.
21KBK37.3	C208.3	To speak, read and write Kannada language as per requirement.
21KBK37.4	C208.4	To communicate (converse) in Kannada language in their daily life with kannada speakers.
21KBK37.5	C208.5	To speak in polite conversation.



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Course Name: Circuit Laboratory using Pspic

Subject Code: - 21EEL382, C209 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21EEL382.1	C207.1	Analyse in an intelligent manner, think better, and perform better.

Course Name: Complex Analysis, Probability and Linear Programming.

Subject Code: - 21MAT41, C210 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21MAT41.1	C210.1	Use the concepts of an analytic function and complex potentials to solve the problems arising in fluid flow.
21MAT41.2	C210.2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
21MAT41.3	C210.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in the engineering field.
21MAT41.4	C210.4	Analyze and solve linear programming models of real-life situations and solve LPP by the simplex method
21MAT41.5	C210.5	Learn techniques to solve Transportation and Assignment problems.

Course Name: Digital System Design

Subject Code: - 21EE42, C211 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21EE42.1	C211.1	Develop simplified switching equation using Karnaugh Maps and QuineMcClusky techniques.
21EE42.2	C211.2	Design Multiplexer, Encoder, Decoder, Adder, Subtractors and Comparator as digital combinational control circuits.
21EE42.3	C211.3	Design flip flops, counters, shift registers as sequential control circuits.
21EE42.4	C211.4	Develop Mealy/Moore Models and state diagrams for the given clocked sequential circuit.
21EE42.5	C211.5	Explain the functioning of Read only and Read/Write Memories, Programmable ROM, EPROM and Flash memory.



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21EE42.6	C211.6	Realize Boolean expressions, adders and subtractors using gates.
21EE42.7	C211.7	Design and test Ring counter/Johnson counter, Sequence generator and 3 bit counters.

Course Name: Microcontroller

Subject Code: - 21EE43, C212 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21EE43.1	C212.1	Outline the 8051 architecture, registers, internal memory organization, addressing modes
21EE43.2	C212.2	Discuss 8051 addressing modes, instruction set of 8051, accessing data and I/O port programming.
21EE43.3	C212.3	Develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic and arithmetic operations, data conversion and timer/counter programming.
21EE43.4	C212.4	Summarize the basics of serial communication and interrupts, also develop 8051 programs for serial data communication and interrupt programming.
21EE43.5	C212.5	Program 8051 to work with external devices for ADC, DAC, Stepper motor control, DC motor control.

Course Name: Electric Motors

Subject Code: - 21EE44, C213 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21EE44.1	C213.1	Explain the construction, operation and classification of DC Motor, AC motor and special purpose motors
21EE44.2	C213.2	Describe the performance characteristics and applications of Electric motors.
21EE44.3	C213.3	Demonstrate and explain the methods of testing of DC machines and determine losses and efficiency.
21EE44.4	C213.4	Control the speed of DC motor and induction motor.
21EE44.5	C213.5	Explain the starting methods, equivalent circuit and phasor diagrams, torque angle, effect of change in excitation and change in load, hunting and damping of synchronous motors



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Course Name: Biology for Engineers

Subject Code: - 21EE45, C214 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21EE45.1	C214.1	Elucidate the basic biological concepts via relevant industrial applications and case studies
21EE45.2	C214.2	Evaluate the principles of design and development, for exploring novel bioengineering projects
21EE45.3	C214.3	Corroborate the concepts of biomimetics for specific requirements
21EE45.4	C214.4	Think critically towards exploring innovative biobased solutions for socially relevant problems

Course Name: Electrical Machines Laboratory - 2

Subject Code: - 21EEL46, C215 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21EEL46.1	C215.1	Test DC machines to determine their characteristics and also to control the speed of DC motor.
21EEL46.2	C215.2	Pre-determine the performance characteristics of DC machines by conducting suitable tests.
21EEL46.3	C215.3	Perform load test on single phase and three phase induction motor to assess its performance.
21EEL46.4	C215.4	Conduct test on induction motor to pre-determine the performance characteristics
21EEL46.5	C215.5	Conduct test on synchronous motor to draw the performance curves

Course Name: Constitution of India & Professional Ethics

Subject Code: 21CIP47, C216 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21CIP47.1	C216.1	Analyse the basic structure of Indian Constitution.
21CIP47.2	C216.2	Remember their Fundamental Rights, DPSP's and Fundamental Duties(FD's) of our constitution.
21CIP47.3	C216.3	know about our Union Government, political structure & codes, procedures.
21CIP47.4	C216.4	Understand our State Executive & Elections system of India.
21CIP47.5	C216.5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.



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Course Name Simulation of Op-Amp Circuits

Subject Code: - 21EEL484, C217 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21EEL484.1	C217.1	Analyse in an intelligent manner, think better, and perform better.

Course Name: Universal Human Values

Subject Code: 21UH49, C218 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21UH49.1	C218.1	By the end of the course, students are expected to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind. They would have better critical ability. They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society). It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction. Therefore, the course and further follow up is expected to positively impact common graduate attributes like: 1. Holistic vision of life 2. Socially responsible behaviour 3. Environmentally responsible work 4. Ethical human conduct 5. Having Competence and Capabilities for Maintaining Health and Hygiene 6. Appreciation and aspiration for excellence (merit) and gratitude for all

Course Name: Inter/Intra Institutional Internship

Subject Code: 21INT49, C219 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21INT49.1	C219.1	Use what they have learned in the class to do work in a company or institute.
21INT49.2	C219.2	Work well in a team and communicate clearly with others.



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21INT49.3	C219.3	Find and solve technical problems using tools and technologies used in the industry.
21INT49.4	C219.4	Understand the importance of being responsible, ethical and aware of how engineering effects the society.
21INT49.5	C219.5	Write and present a report explaining what they did and learn during the internship

Course Name: Transmission and Distribution

Subject Code: - 21EE51, C301 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21EE51.1	C301.1	Explain transmission and distribution scheme, identify the importance of different transmission systems and types of insulators.
21EE51.2	C301.2	Analyze and compute the parameters of the transmission line for different configurations.
21EE51.3	C301.3	Assess the performance of overhead lines.
21EE51.4	C301.4	Interpret corona, explain the use of underground cables.
21EE51.5	C301.5	Classify different types of distribution systems; examine its quality & reliability

Course Name: Control Systems

Subject Code: - 21EE52, C302 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21EE52.1	C302.1	Analyze and model electrical and mechanical system using analogous.
21EE52.2	C302.2	Formulate transfer functions using block diagram and signal flow graphs.
21EE52.3	C302.3	Analyze the stability of control system, ability to determine transient and steady state time response.
21EE52.4	C302.4	Illustrate the performance of a given system in time and frequency domains, stability analysis using Root locus and Bode plots.
21EE52.5	C302.5	Discuss stability analysis using Nyquist plots, Design controller and compensator for a given specification.



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21EE52.6	C302.6	Utilize software package and discrete components in assessing the time and frequency domain response of a given second order system.
21EE52.7	C302.7	Design, analyze and simulate Lead, Lag and Lag – Lead compensators for given specifications.
21EE52.8	C302.8	Determine the performance characteristics of ac and DC servomotors and synchro-transmitter receiver pair used in control systems.
21EE52.9	C302.9	Simulate the DC position and feedback control system to study the effect of P, PI, PD and PID controller and Lead compensator on the step response of the system.
21EE52.10	C302.10	Develop a script files to plot Root locus, Bode plot and Nyquist plot to study the stability of a system using software package.

Course Name: Power System Analysis - 1

Subject Code: - 21EE53, C303 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21EE53.1	C303.1	Model the power system components & construct per unit impedance diagram of power system.
21EE53.2	C303.2	Analyze three phase symmetrical faults on power system.
21EE53.3	C303.3	Compute unbalanced phasors in terms of sequence components and vice versa, also develop sequence networks.
21EE53.4	C303.4	Analyze various unsymmetrical faults on power system.
21EE53.5	C303.5	Examine dynamics of synchronous machine and determine the power system stability.

Course Name: Power Electronics

Subject Code: - 21EE54, C304 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21EE54.1	C304.1	To give an overview of applications power electronics, different types of power semiconductor devices, their switching characteristics, power diode characteristics, types, their operation and the effects of power diodes on RL circuits.
21EE54.2	C304.2	To explain the techniques for design and analysis of single phase diode rectifier circuits



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21EE54.3	C304.3	To explain different power transistors, their steady state and switching characteristics and limitations.
21EE54.4	C304.4	To explain different types of Thyristors, their gate characteristics and gate control requirements.
21EE54.5	C304.5	To explain the design, analysis techniques, performance parameters and characteristics of controlled rectifiers, DC- DC, DC -AC converters and Voltage controllers.

Course Name: Power Electronics Laboratory

Subject Code: - 21EEL55, C305 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21EEL55.1	C305.1	Obtain static characteristics of semiconductor devices to discuss their performance.
21EEL55.2	C305.2	Trigger the SCR by different methods
21EEL55.3	C305.3	Verify the performance of single phase controlled full wave rectifier and AC voltage controller with R and RL loads.
21EEL55.4	C305.4	Control the speed of a DC motor, universal motor and stepper motors.
21EEL55.5	C305.5	Verify the performance of single phase full bridge inverter connected to resistive load.

Course Name: Research Methodology & Intellectual Property Rights

Subject Code: - 21RMI56, C306 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21RMI56.1	C306.1	To know the meaning of engineering research
21RMI56.2	C306.2	To know the procedure of Literature Review and Technical Reading
21RMI56.3	C306.3	To Know the fundamentals of patent law and drafting procedure.
21RMI56.4	C306.4	Understanding the copyright laws and subject matters of copyrights and designs
21RMI56.5	C306.5	Understand the basic principle of Design rights.

Course Name: Environmental Studies

Subject Code: - 21CIV57, C307 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
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21CIV57.1	C307.1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale
21CIV57.2	C307.2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment
21CIV57.3	C307.3	Demonstrate ecology knowledge of a complex relationship between biotic and a biotic components.
21CIV57.4	C307.4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues

Course Name: Renewable Energy Projects

Subject Code: - 21EEP584, C308 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21EEP584.1	C308.1	Analyse in a systematic way, think better, and perform better

Course Name: Management and Entrepreneurship

Subject Code: - 21EE61, C309 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21EE61.1	C309.1	Explain the field of management, task of the manager, planning and steps in decision making.
21EE61.2	C309.2	Discuss the structure of organization, importance of staffing, leadership styles, modes of communication, techniques of coordination and importance of managerial control in business.
21EE61.3	C309.3	Explain the concepts of entrepreneurship and a businessman's social responsibilities towards different groups.
21EE61.4	C309.4	Show an understanding of role of SSI's in the development of country and state/central level institutions/ agencies supporting business enterprises.
21EE61.5	C309.5	Discuss the concepts of project management, capital budgeting, project feasibility studies, need for project report and new control techniques.



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Course Name: Power System Analysis - 2

Subject Code: - 21EE62, C310 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21EE62.1	C310.1	Formulate network matrices and models for solving load flow problems.
21EE62.2	C310.2	Perform steady state power flow analysis of power systems using numerical iterative techniques.
21EE62.3	C310.3	Solve issues of economic load dispatch and unit commitment problems.
21EE62.4	C310.4	Analyze short circuit faults in power system networks using bus impedance matrix.
21EE62.5	C310.5	Apply Point by Point method and Runge Kutta Method to solve Swing Equation.
21EE62.6	C310.6	Develop a program in suitable package to assess the performance of medium and long transmission lines
21EE62.7	C310.7	Develop a program in suitable package to obtain the power angle characteristics of salient and non-salient pole alternator.
21EE62.8	C310.8	Develop a program in suitable package to assess the transient stability under three phase fault at different locations in a of radial power systems.
21EE62.9	C310.9	Develop programs in suitable package to formulate bus admittance and bus impedance matrices of interconnected power systems.
21EE62.10	C310.10	Use suitable package to solve power flow problem for simple power systems
21EE62.11	C310.11	Use suitable package to study unsymmetrical faults at different locations in radial power systems
21EE62.12	C310.12	Use of suitable package to study optimal generation scheduling problems for thermal power plants.

Course Name: Signals and Digital Signal Processing

Subject Code: - 21EE63, C311 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21EE63.1	C311.1	Discuss classification and basic operations that can be performed on both continuous and discrete time signals



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21EE63.2	C311.2	Evaluate Discrete Fourier Transform of a sequence and the convolution of two sequences to determine the output sequence.
21EE63.3	C311.3	Evaluate Discrete Fourier Transform of a sequence by using fast methods.
21EE63.4	C311.4	Design Butterworth and Chebyshev IIR digital filters and FIR filters using different techniques.
21EE63.5	C311.5	Develop different structures for IIR and FIR filters.

Course Name: Electrical Engineering Materials

Subject Code: - 21EE644, C312 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21EE644.1	C312.1	Discuss electrical and electronics materials, their importance, classification, and operational requirements.
21EE644.2	C312.2	Discuss conducting, dielectric, insulating, and magnetic materials used in engineering, their properties and classification.
21EE644.3	C312.3	Explain the phenomenon superconductivity, super conducting materials and their application in engineering.
21EE644.4	C312.4	Explain the plastic and its properties and applications.

Course Name: Renewable Energy Power Plant

Subject Code: - 21EE652, C313 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21EE652.1	C313.1	Discuss causes of energy scarcity and its solution, energy resources and availability of renewable energy.
21EE652.2	C313.2	Outline energy from sun, energy reaching the Earth's surface and solar thermal energy applications.
21EE652.3	C313.3	Discuss types of solar collectors, their configurations, solar cell system, its characteristics and their applications.
21EE652.4	C313.4	Explain generation of energy from hydrogen, wind, geothermal system, solid waste and agriculture refuse.
21EE652.5	C313.5	Discuss production of energy from biomass, biogas.
21EE652.6	C313.6	Summarize tidal energy resources, sea wave energy and ocean thermal energy.



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Course Name: Digital Signal Processing Laboratory

Subject Code: - 21EEL66, C314 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21EEL66.1	C314.1	Conduct sampling of signals in time and frequency domains.
21EEL66.2	C314.2	Evaluate the impulse response of a system
21EEL66.3	C314.3	Obtain convolution of given sequences to evaluate the response of a system.
21EEL66.4	C314.4	Compute DFT and IDFT of a given sequence using the basic definition and/or fast methods.
21EEL66.5	C314.5	Provide a solution for a given difference equation.
21EEL66.6	C314.6	Design and implement IIR and FIR filters

Course Name: Mini Project

Subject Code: - 21EEMP67, C315 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21EEMP67.1	C315.1	Identify and define a practical engineering problem based on theoretical knowledge from core subjects.
21EEMP67.2	C315.2	Develop preliminary designs, models, or simulations to propose solutions for the identified problem.
21EEMP67.3	C315.3	Work collaboratively or individually to implement and test the proposed solution.
21EEMP67.3	C315.4	Analyze and interpret results to evaluate the effectiveness of the solution.
21EEMP67.4	C315.5	Communicate technical information effectively through project reports and presentations.

Course Name: -Innovation/Entrepreneurship/Societal Internship

Subject Code: - 21INT68, C316 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21INT68.1	C316.1	Understand the basic concepts of innovation, entrepreneurship, and societal development through practical exposure.
21INT68.2	C316.2	Develop an entrepreneurial mindset and identify opportunities for innovation in various sectors.



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21INT68.3	C316.3	Gain hands-on experience in societal projects, understanding social challenges and sustainable solutions.
21INT68.4	C316.4	Build skills in project planning, execution, and management in the context of entrepreneurship and societal impact.
21INT68.5	C316.5	Demonstrate effective communication, teamwork, and ethical behavior while engaging with communities and stakeholders.

Course Name: High Voltage and Power System Protection

Subject Code: - 21EE71, C401 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21EE71.1	C401.1	Apply the knowledge of dielectric property for insulation, it's performances as per Standards and High voltage application in power system Equipment's.
21EE71.2	C401.2	Analyze the circuits of high voltages, high currents in Generation and Measurements.
21EE71.3	C401.3	Apply relays to the power system protection.
21EE71.4	C401.4	Discuss the construction, operating principles and performances of circuit breaker.
21EE71.5	C401.5	Discuss protection of generators, motors, Transformer and Bus Zone Protection.
21EE71.6	C401.6	Describe the causes of over voltages and their remedial measures.
21EE71.7	C401.7	Analyze the spark over characteristics using High voltages for checking the breakdown phenomenon and dielectric strength of dielectric materials.
21EE71.8	C401.8	Experimentally verify the characteristics of over current, over voltage, under voltage using electromagnetic, static, distance and impedance relays
21EE71.9	C401.9	Demonstration of protective schemes for motor and feeders

Course Name: Power System Operation and Control

Subject Code: - 21EE72, C402 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21EE72.1	C402.1	Describe various levels of controls in power systems, architecture and configuration of SCADA.



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21EE72.2	C402.2	To explain components, architecture and configuration of SCADA.
21EE72.3	C402.3	To explain basic generator control loops, functions of Automatic generation control, speed governors and mathematical models of Automatic Load Frequency Control
21EE72.4	C402.4	To explain automatic generation control, voltage and reactive power control in an interconnected power system
21EE72.5	C402.5	To explain reliability and contingency analysis, state estimation and related issues.

Course Name: Power System Planning

Subject Code: - 21EE731, C403 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21EE731.1	C403.1	Discuss primary components of power system planning, planning methodology for optimum power system expansion and load forecasting.
21EE731.2	C403.2	Understand economic appraisal to allocate the resources efficiently and appreciate the investment decisions
21EE731.3	C403.3	Discuss expansion of power generation and planning for system energy in the country, evaluation of operating states of transmission system, their associated contingencies and the stability of the system.
21EE731.4	C403.4	Discuss principles of distribution planning, supply rules, network development and the system studies
21EE731.5	C403.5	Discuss reliability criteria for generation, transmission, distribution and reliability evaluation and analysis, grid reliability, voltage disturbances and their remedies
21EE731.6	C403.6	Discuss planning and implementation of electric –utility activities, market principles and the norms framed.

Course Name: Industrial Drives and Applications

Subject Code: - 21EE744, C404 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21EE744.1	C404.1	Explain the advantages, choice and control of electric drive
21EE744.2	C404.2	Explain the dynamics, generating and motoring modes of operation of electric drives



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21EE744.3	C404.3	Explain the selection of motor power rating to suit industry requirements
21EE744.4	C404.4	Analyze the performance & control of DC motor drives using controlled rectifiers
21EE744.5	C404.5	Analyze the performance & control of converter fed Induction motor, synchronous motor & stepper motor drives.

Course Name: NON-TRADITIONAL MACHINING

Subject Code: - 21ME751, C405 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21ME751.1	C405.1	Understand the compare traditional and non-traditional machining process and recognize the need for Non-traditional machining process.
21ME751.2	C405.2	Understand the constructional features, performance parameters, process characteristics, applications, advantages and limitations of USM, AJM and WJM.
21ME751.3	C405.3	Identify the need of Chemical and electro-chemical machining process along with the constructional features of the equipment, process parameters, process characteristics, applications, advantages and limitations.
21ME751.4	C405.4	Understand the constructional feature of the equipment, process parameters, process characteristics, applications, advantages and limitations EDM & PAM.
21ME751.5	C405.5	Understand the LBM equipment, LBM parameters, and characteristics. EBM equipment and mechanism of metal removal, applications, advantages and limitations LBM & EBM.

Course Name: Project work

Subject Code: - 21EEP76, C406 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21EEP76.1	C406.1	Identify, analyze, and formulate engineering problems based on the knowledge acquired in core and elective subjects.
21EEP76.2	C406.2	Apply research methodology, design thinking, and engineering principles to develop innovative solutions and prototype models.
21EEP76.3	C406.3	Work effectively as an individual or in a team to plan, design, implement, and test an engineering project.



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21EEP76.4	C406.4	Communicate technical ideas and project results effectively through written reports and oral presentations.
21EEP76.5	C406.5	Demonstrate professional ethics, lifelong learning, and an awareness of societal and environmental responsibilities in engineering practice.

Course Name: Technical Seminar

Subject Code: - 21EE81, C407 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21EE81.1	C407.1	Identify and explore current topics of technical importance through literature survey and research.
21EE81.2	C407.2	Develop skills in organizing and presenting technical information effectively using appropriate communication tools.
21EE81.3	C407.3	Demonstrate ability to critically analyze technical literature and synthesize relevant information.
21EE81.4	C407.4	Exhibit professional communication skills through technical report writing and oral presentations.
21EE81.5	C407.5	Foster independent learning, teamwork, and ethical responsibilities in the dissemination of technical knowledge.

Course Name: Industrial Internship

Subject Code: - 21INT822, C408 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21INT822.1	C408.1	Apply theoretical knowledge and technical skills gained in the academic curriculum to real-world industrial environments.
21INT822.2	C408.2	Gain practical experience in using tools, equipment, and technologies relevant to the chosen engineering discipline.
21INT822.3	C408.3	Develop problem-solving skills and adapt to workplace challenges in an industrial or research setting.
21INT822.4	C408.4	Enhance professional communication, teamwork, and interpersonal skills in a work environment.
21INT822.5	C408.5	Prepare and present a detailed internship report demonstrating learnings, contributions, and reflections on the industrial experience.