Course Title: Communication Skills in English

Course Code: C101

Course Outcomes (COs):

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

CO1: Understand the meaning, process of communication, types of communication and barrier in communication and manner to communicate effectively.

CO2: Comprehend soft skill and hard skill and to apply it in day to day life.

CO3: Comprehend the seen passages and develop basic speaking and writing skills including proper usage of language and vocabulary so that they can become highly confident and skilled speakers and writers.

CO4: Write personnel & business letter and drafting of notice and minutes of a meeting.

CO5: Enhancement of vocabulary and apply English grammar rules correctly while framing a sentence, answer and writing letter, application etc and enhancement of vocabulary.

Course Title: Engineering Physics

Course Code: C102

Course Outcomes (COs):

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

CO1: Classify different physical quantities and derive their units and dimensions.

CO2: Differentiate between scalar and vector quantity and use its properties to understand physical laws & different types of motion .

CO3: Apply the basic concept of force, torque, work, energy, power, friction, Moment of Inertia to solve simple classical Mechanics problems.

CO4: Apply different laws of elasticity, hydro statics and hydro dynamics to calculate various mechanical properties of solid and fluids.

CO5: Analyze various modes of heat transfer and behaviour of matter under exposure of heat and select appropriate thermometer to measure various range of temperature in industrial application.

Course Title: Engineering Mathematics

Course Code: C103

Course Outcomes (COs):

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

CO1: Apply the necessary background in matrices and determinants to finding solutions and aid in interpreting or analyzing linear systems.

CO2: Use Trigonometry and related basic concepts to solve applied technical problems

CO3: Demonstrate the ability to algebraically analyze basic functions used in trigonometry.

CO4: Analyze that coordinate geometry provide connection between algebra and geometry thorough graphs of lines and curves.

CO5: Understand the concepts of plains and sphere providing formation of equations and understanding various properties involving in it

Course Title: Basic Electrical & Electronics Engineering

Course Code: C104

Course Outcomes (COs):

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

CO1: Identify & analyze different types of electronics components and signals.

CO2: Analyze basic op-amp circuits and digital circuits.

CO3: Develop the concept on Electrical and magnetic circuit parameters.

CO4: Organize of Electrical Machines & Transformer.

CO5: Interpret knowledge on AC circuit & Solve Numerical.

Course Title: Computer Application

Course Code: C109

Course Outcomes (COs):

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

CO1: Develop the skill to handle & operate computer and access the internet.

CO2: Assemble the PC, install & configure OS and other software/Hardware.

CO3: Design & develop the website using mark up language.

CO4: Create and work with various office tools.

CO5: Enhance the skill to protect the system and its information from cyber attacks.

Course Title: Engineering Chemistry

Course Code: C110

Course Outcomes (COs):

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

CO1: Solve various engineering problems applying the basic knowledge of atomic, molecular, electronic modifications and Chemical bonding by analyzing the technology based on them.

CO2: Identify the problems associated with raw water used in drinking & boilers and sewage water and solve the problems by using different water treatment methods.

CO3: Analyze the properties engineering materials and substitute metals with conducting polymers and also produce cheaper biodegradable polymers to reduce environmental pollution.

CO4: Use relevant fuel and lubricants for domestic and industrial applications

CO5: To impart knowledge on the essential aspects of electrochemical cells, emf, applications of emf measurements and understand the Principles of corrosion and corrosion control.

Course Title: Engineering Mathematics- II

Course Code: C111

Course Outcomes (COs):

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

CO1: Apply the concept of Determinants and Matrices on 3rd order system of equations to find the unknown parameters and simple programming using MATLAB.

CO2: Apply Integral calculus to obtain area and volume of solid.

CO3: Connect algebra and geometry through graphs of lines and curves.

CO4: Differentiate between a resultant and a concurrent force through vector algebra.

CO5: To model simple physical problems in the form of a differential equation, analyze and interpret its solutions.

Course Title: Engineering Mechanics

Course Code: C112

Course Outcomes (COs):

After completing this course, student will be able to:

CO1: Analyze the coplanar force system and find out the resultant force of this system by applying basics of mechanics.

CO2: Determine unknown forces of different engineering systems by applying laws of equilibrium.

CO3: Apply the principle of friction in various conditions when the object is in static equilibrium.

CO4: Find the centroid and centre of gravity of various components in engineering system.

CO5: Analyze different simple machines to find out different influencing parameters viz. Mechanical Advantage, Velocity Ratio and Efficiency.

Course Title: Engineering Mathematics-III

Course Code: C201

Course Outcomes (COs):

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

CO1: Apply complex number concept in electricity, quadratic equation.

CO2: Apply Matrices in Engineering fields such as Electrical Circuits and Linear programming.

CO3: Transform Engineering problems to mathematical models with the help of differential equations and familiarize with the methods of solving by Analytical methods, Transform method and operator method and Numerical methods

CO4: Solve algebraic equations by iterative Methods easily programmable in computers

CO5: Analysis data and develop interpolating polynomials through method of differences

Course Title: Circuit and Network Theory

Course Code: C202

Course Outcomes (COs):

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

CO1: Identify and apply principles of magnetic circuits and coupled circuits.

CO2: Analyze and solve electrical circuits using various techniques, incorporating network theorems for effective circuit design and analysis.

CO3: Integrate AC circuits, including power, resonance, and polyphase systems.

CO4: Execute circuit behaviour in transient conditions.

CO5: Outline and Design two-port networks and filters.

Course Title: Element of Mechanical Engineering

Course Code: C203

Course Outcomes (COs):

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

CO1: Understand the laws of thermodynamics and their applications to gases and steam systems.

CO2: Apply steam tables to calculate heat and properties of wet, dry, and superheated steam.

CO3: Analyze performance parameters of steam engines and turbines using diagrams and efficiency formulas.

CO4: Evaluate fluid properties, pressures, and energy using Bernoulli's theorem and continuity equations.

CO5: Create operational solutions with hydraulic devices like intensifiers, lifts, and rams for practical applications.

Course Title: Electrical Engineering Material

Course Code: C204

Course Outcomes (COs):

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

CO1: Describe the properties, characteristics, and applications of conducting materials.

CO2: Explain the fundamental concepts of semiconductors, their properties, and applications.

CO3: Structure the properties, classification, and applications of insulating materials.

CO4: Compare the electrical properties of dielectric materials and their applications.

CO5: Classify the magnetic properties of materials and identify the properties and applications of specialized materials for various engineering applications.

Course Title: Environmental Studies

Course Code: C205

Course Outcomes (COs):

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

CO1: Students will understand the multidisciplinary nature of environmental studies, the importance of public awareness, and analyze sustainable solutions for the conservation and equitable use of natural resources.

CO2: Students will understand ecosystem structure, energy flow, and analyze the characteristics of forest and aquatic ecosystems.

CO3: Students will understand biodiversity definitions, values, classifications, and threats, fostering awareness for conservation efforts.

CO4: Evaluating the causes, impacts, and management strategies for various types of environmental pollution.

CO5: Creating the social, economic, and environmental dimensions of sustainable development and the role of individuals in environmental protection.

Course Title: Energy Conversion – I

Course Code: C209

Course Outcomes (COs):

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

CO1: Comprehending the fundamental principles, construction, and operation of DC generators, including their performance parameters.

CO2: Demonstrating the principles, characteristics, and performance of DC motors.

CO3: Illustrating the construction, operation, and performance of single-phase transformers.

CO4: Discriminating the construction, operation, and applications of auto-transformers and their comparison with two-winding transformers and tap-changing techniques.

CO5: Executing the principles, construction, and applications of instrument transformers including their error characteristics.

Course Title: Analog Electronics and OP-AMP

Course Code: C210

Course Outcomes (COs):

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

CO1: Understand and analyze diode and transistor characteristics.

CO2: Design and Evaluate rectifier circuits and filters.

CO3: Examine and Apply transistor configuration in amplification.

CO4: Analyze and implement feedback and oscillator circuits..

CO5: Employ operational amplifiers in various circuit configurations.

Course Title: Electrical Measurement & Instrumentation

Course Code: C211

Course Outcomes (COs):

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

CO1: Indicate the principles, construction, and operation of analog measuring instruments.

CO2: Elaborate the construction, principles and error correction of wattmeters and energy meters.

CO3: Outline the principles and operation of tachometers, frequency meters, and power factor meters for precise measurement of speed, frequency and power factor.

CO4: Execute techniques for measuring resistance, inductance, and capacitance.

CO5: Develop a comprehensive understanding the principles and applications of Transducers and CRO .

Course Title: Generation, Transmission & Distribution

Course Code: C212

Course Outcomes (COs):

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

CO1: Understand the fundamentals of electricity generation from thermal, hydro, nuclear, and solar sources, including layout diagrams for generating stations.

CO2: Analyze and design the mechanical and electrical aspects of transmission lines, including the application of principles in solving related numerical problems.

CO3: Calculate regulation and efficiency for short and medium lines, and discuss EHV AC and HVDC transmission, including their advantages and challenges.

CO4: Explain the types and installation methods of cables, and analyze different distribution schemes with problem-solving applications.

CO5: Acquire knowledge of economic factors in power systems, including power factor, load curves, demand and diversity factors, tariffs, and substation layouts.

Course Title: Entrepreneurship and Management & Smart Technology

Course Code: C301

Course Outcomes (COs):

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

CO1: Identifying and classifying entrepreneurs and their characteristics; understanding types and forms of business ownership; exploring the role of banks. Developing business plans, identifying opportunities, and selecting products.

CO2: Formulate Project planning and preparation of project report, feasibility study

CO3: Understanding principles and functions of management, learning the qualities required to be a good leader, importance of motivation for an individual.

CO4: Understanding the different areas of management.

CO5: Description of work culture and uses of IOT, overview of patent rights and trade marks

Course Title: Energy Conversion – II

Course Code: C302

Course Outcomes (COs):

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

After completion of the course, students will acquire the ability to

CO1: Express the construction, operation, and performance characteristics of alternators.

CO2: Translate the performance of synchronous motors under various operating conditions.

CO3: Estimate the principles of operation and characteristics of three-phase induction motors.

CO4: Analyze the performance and applications of single-phase induction motors and commutator motors.

CO5: Distinguish the principles and applications of special electrical machines and three phase transformers.

Course Title: Digital Electronics & Microprocessor

Course Code: C303

Course Outcomes (COs):

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

CO1: Explain number systems, basic logic gates, Boolean algebra and define characteristics of logic families and calculate their parameters

CO2: Analyze the working mechanism and design guidelines of different combinational circuits in the digital system.

CO3: Apply the working mechanism and design guidelines of different sequential circuits.

CO4: To understand the concepts of Architecture of 8085 Microprocessor.

CO5: Understand concept of interfacing of peripheral devices and their applications.

Course Title: Utilization of Electrical Energy & Traction

Course Code: C304

Course Outcomes (COs):

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

CO1: Understand electrolytic process and its applications.

CO2: Explain different methods of electrical heating and their uses.

CO3: Distinguish welding techniques and their applications in joining metals.

CO4: Analyze illumination principles and design basic lighting systems.

CO5: Choose and implement electric motors for diverse applications, and gain insight into the fundamental principles of electric traction systems.

Course Title: Power Electronics and PLC

Course Code: C305

Course Outcomes (COs):

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

CO1: Understand the fundamental principles of power electronic devices, including their construction, operation, characteristics, and applications.

CO2: Analyze the factors influencing the performance of power electronic devices and apply appropriate protection and control techniques.

CO3: Analyze the operation of AC-DC and DC-DC converters to evaluate their suitability for specific applications.

CO4: Analyze inverters and cycloconverters for AC power conversion and apply power electronics in motor control systems.

CO5: Understand and apply the principles of Programmable Logic Controllers (PLCs) to automate industrial processes.

Course Title: Electrical Installation and Estimating

Course Code: C310

Course Outcomes (COs):

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

CO1: Understand the Indian Electricity Rules, including safety regulations and guidelines for electrical installations. Estimate materials for pole-mounted and plinth-mounted substations, considering load, site, and safety standards.

CO2: Design and implement safe and efficient electrical installations, including wiring, accessories, and lighting, in line with standards and regulations.

CO3: Design, estimate, and implement internal wiring systems for residential and commercial applications, focusing on load, safety, and cost-effectiveness.

CO4: Construct, estimate, and design overhead transmission and distribution lines, considering conductor selection, line parameters, safety, and economic factors.

CO5: Analyze, design, estimate, and install overhead service lines for residential and commercial applications, ensuring load capacity, safety, and cost-efficiency.

Course Title: Switch Gear and Protective Devices

Course Code: C311

Course Outcomes (COs):

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

CO1: Analyze essential switchgear features and perform fault calculations to control and assess fault conditions in a 3-phase power system.

CO2: Understand and compare fuse and circuit breaker types, characteristics, and arc extinction methods for effective electrical protection.

CO3: Understand the principles, types, and key terms of protective relays and static relays, to evaluate their role in various electrical protection schemes.

CO4: Analyze protection schemes for alternators, transformers, bus bars, and transmission lines for reliable fault management.

CO5: Understand protection methods against over voltages and lightning, including lightning arresters, surge absorbers.

Course Title: Control System Engineering

Course Code: C312

Course Outcomes (COs):

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

CO1: Describe basic control system principles, including system types, transfer functions, and key components, for analyzing open and closed-loop behaviors.

CO2: Apply block diagram reduction and signal flow graph methods to find equivalent transfer functions.

CO3: Analyze time response and performance of control systems, including steady-state error and PID effects.

CO4: Evaluate system stability and performance using root locus and frequency response methods, focusing on plot construction and gain and phase margin analysis.

CO5: Assess control system stability using Nyquist plots and the Nyquist criterion.

Course Title: Renewable Energy Systems

Course Code: C313

Course Outcomes (COs):

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

CO1: Able to understand the renewable energy sources available at present.
CO2: Able to understand the solar energy operation and its characteristics.
CO3: To educate the wind energy operation and its types.
CO4: To educate the tidal and geothermal energy principles and its operation.
CO5: Able to understand the biomass energy generation and its technologies