Program Outcomes:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

2019 Pattern

Course Outcomes

	Engineering Mathematics-I
C101.1	Explain Mean value theorems and its generalizations leading to Taylors and Maclaurin's series.
C101.2	Determine Fourier representation and Harmonic analysis of periodic continuous and discrete systems.
C101.3	Apply Partial, Total derivatives and Jacobean in various engineering problems.
C101.4	Use matrices in various engineering problems.

	Engineering Physics
C102.1	Explain concepts and applications of optics, Lasers, semiconductor Physics, magnetism and superconductivity, Quantum mechanics, non-destructive testing and nanotechnology.
C102.2	Apply the principles of optics, semiconductor properties of solids, lasers, optical fibres, and quantum mechanics to obtain desired parameters.
C102.3	Solve the numerical using appropriate formula.
C102.4	Conduct an experiment to determine unknown physical parameter.

	Engineering Chemistry
C109.1	·DESCRIBE advanced engineering materials for various engineering applications
C109.2	·ILLUSTRATE different methodologies for water treatment, analysis of chemical fuel, corrosion and its control.
C109.3	·EXPLAIN electroanalytical and spectroscopic techniques for material/chemical analysis
C109.4	·SOLVE the problems based on the learnt chemistry principles

	Programming and Problem Solving
C105.1	Understand different problem solving strategies, basics of python programming and program Designing tools.
C105.2	Choose most appropriate programming constructs and features to **solve** the problems in diversified domains.
C105.3	Exhibit the programming skills for the problems those require the writing of well documented programs including use of the logical constructs of language, Python.
C105.4	Demonstrate significant experience with the Python program development environment.

	Engineering Mechanics
C111.1	Students will be able to EXPLAIN the characteristics of force, force systems and its application.
C111.2	Students will be able to SOLVE engineering problems to find centroid, moment of inertia and friction
C111.3	Students will be able to APPLY principles of equilibrium to find reactions of beams and forces in space
C111.4	Students will be able to ANALYSE trusses, frames for finding member forces and apply principles of equilibrium to calculate forces in cables
C111.5	Students will be able to CONSTRUCT a solution to find position, velocity and acceleration

	of particle using principles of kinematics and kinetics and Work, Power, Energy
C111.6	Students will be able to APPLY concepts and principles in practical, to draw inferences

	Audit Course I
C107.1	Students will be able to Demonstrate an integrative approach to environmental issues with a focus on sustainability.
C107.2	Students will be able to Explain and identify the role of the organism in energy transfers in different ecosystems.
C107.3	Students will be able to Distinguish between and provide examples of renewable and non-renewable resources & analyze personal consumption of resources
C107.4	Students will be able to Identify key threats to biodiversity and develop appropriate policy options for conserving biodiversity in different settings.

	Engineering Graphics
C112.1	Use basic rules of engineering graphics to draw simple engineering objects.
C112.2	Use fundamental concepts of engineering graphics to draw various engineering curves.
C112.3	Apply the concept of orthographic projection of an object to draw several 2D views and its sectional views for visualizing the physical state of the object.
C112.4	Apply the visualization skill to draw a simple isometric projection from given orthographic views precisely using drawing equipment.
C112.5	Use basic rules of engineering graphics to draw the development of lateral surfaces of cut section of geometrical solids.
C112.6	Use computer aided drafting tool to draw fully-dimensioned 2D, 3D Drawing.

	Workshop
C106.1	To comprehend the safety measures / norms to be followed while using the cutting tools / Machine tools in workshop.
C106.2	To Study and understand working functions of various machine tools like lathe, Milling, Drilling, Shaper / grinding to manufacture a job.
C106.3	To Identify and apply suitable tools for machining processes including turning, facing, thread cutting and tapping, Drilling, Milling and shaping / Grinding.
C106.4	To study and Practice on various manufacturing processes including fitting, carpentry, sheet metal, welding and machine tools.

	Basic Electronics Engineering
C110.1	Explain the working of various diodes, transistors and their applications.
C110.2	Design basic Digital circuits using Logic Gates.
C110.3	Explain operating principles of various instruments and sensors.
C110.4	Describe fundamentals of communication systems.

	Basic Electrical Engineering
C104.1	Explain difference between electrical and magnetic circuits and mathematical relation for self and mutual inductance along with coupling effect

C104.2	Calculate series, parallel and composite capacitor as well as characteristics parameters of alternating quantity and phasor arithmetic
C104.3	Describe expression for impedance, current, power in series and parallel RLC circuit with AC supply along with phasor diagram.
C104.4	Calculate efficiency and regulation of single phase transformer and the relation between phase and line electrical quantities in polyphase networks.
C104.5	Solve the resistive circuits using star-delta conversion KVL, KCL and different network theorems under DC supply.
C104.6	Describe work, power, energy relations and various batteries for different applications, concept of charging and discharging and depth of charge

	Project Based Learning
C113.1	Make use of latest technologies to design and develop applications.
C113.2	Analyze real world problems from social-scientific perspectives.
C113.3	Apply self-learning skill and communicate effectively as an individual or in a team.

	Audit Course II
C114.1	Students will be able to Have an understanding of environmental pollution and the science behind those problems and potential solutions.
C114.2	Students will be able to Have knowledge of various acts and laws and will be able to identify the industries that are violating these rules.
C114.3	Students will be able to Assess the impact of ever increasing human population on the biosphere: social, economic issues and role of humans in conservation of natural resources.
C114.4	Students will be able to Learn skills required to research and analyze environmental issues scientifically and learn how to use those skills in applied situations such as careers that may involve environmental problems and/or issues.

	Engineering Mathematics-II
C108.1	Solve first order first degree differential equations for real world problem.
C108.2	Solve definite integrals using advanced techniques which are needed in evaluating multiple integrals and their applications.
C108.3	Analyze curve points and trace curve to find its arc length.
C108.4	Apply solid geometry to find equations of sphere, cone and cylinder.
C108.5	Solve multiple integrals to find different parameters.

	Systems in Mechanical Engineering
C103.1	Describe and compare the conversion of energy from renewable and non-renewable energy sources
C103.2	Explain basic laws of thermodynamics, heat transfer and their applications
C103.3	List down the types of road vehicles and their specifications
C103.4	Explain basic parts and transmission system of a road vehicle
C103.5	Discuss different manufacturing processes used in industries.
C103.6	Identify various types of mechanism and its application

	Engineering Chemistry Practical
C109.1	DEMONSTRATE skills to synthesize organic polymers
C109.2	DEMONSTRATE the handling of fundamental laboratory instruments for analyses such as

	Conductometer, pH meter and spectroscopy.
C109.3	APPLY classical methods for analysis of water.
C109.4	DETERMINE avg.molecular wt.of polymer using viscometer.

	Basic Electronics Engineering Practical
C110.1	Identification components and Study of basic Electronics and measuring equipment
C110.2	Construct basic electronic circuits and plot their characteristics
C110.3	Explain working of transducers and electronic appliances
C110.4	Build circuit with the help of BJT/ MOSFET/ Op-Amp/Logic Gates along with one sensor

	Basic Electrical Engineering Practical
C104.1	Apply knowledge while handling various electrical equipment and read electricity bills
C104.2	Analyze single phase AC circuits, steady state response and series resonance
C104.3	Calculate efficiency and regulation of single phase transformer and the relation between phase and line electrical quantities in polyphase networks.
C104.4	Analyze the resistive circuits using KVL, KCL and different network theorems under DC supply.

	Systems in Mechanical Engineering Practical
C103.1	Identify the vehicle components and compare their specifications by visiting industry/workshop/showroom.
C103.2	Describe power train system, steering system, suspension system of vehicle.
C103.3	Explain the working of steam generator.
C103.4	Describe the working of CNC using basic programming.

	Engineering Physics Practical
C102.1	Demonstrate optical experiments
C102.2	Determine the parameters related to semiconductor devices experimentally
C102.3	Apply modern tools such as LASER and Ultrasonic distance metre for distance measurement.

F.E Coordinator


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First Year
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