PROGRAMME EDUCATIONAL OBJECTIVES:

PEO1: Apply their knowledge of design, digital and computational analysis, experimentation and testing, smart manufacturing, technical services, and research to solve real-world engineering problems.

PEO2: Collaborate with stakeholders, continuously enhance their competencies, and demonstrate ethical practices, teamwork, and leadership qualities to thrive in a multicultural global environment.

PEO3: Engage in multidisciplinary research, innovation, and entrepreneurial activities, and apply their technical knowledge to create sustainable solutions addressing engineering, environmental, and societal challenges.

POs and PSOs - Knowledge and Attitude Profile (WK)

WK1 A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences.

WK2 Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and **modeling applicable to the discipline.**

WK3 A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.

WK4 Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.

WK5 Knowledge, including of recent developments, in specialist areas, that supports the design and operations in a practice area.

WK6 Knowledge of engineering practice (technology) in the practice areas in the engineering discipline.

WK7 Knowledge of the role of engineering in society and identified issues in engineering safety and health development.

WK8 Engagement with selected knowledge in the research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate complex issues.

WK9 Ethics, inclusive behavior and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc., with mutual understanding and respect, and inclusive attitudes.

PROGRAM OUTCOMES (POs)

PO1– Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively, to the solution of complex engineering problems.

PO2 – Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (WK1 to WK4)

PO3 – Design/Development of Solutions: Design creative solutions for complex engineering problems and design systems, components or processes that meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

PO4 – Conduct Investigations of Complex Problems: Conduct investigations using research-based knowledge including design of experiments, modelling, analysis, and interpretation of data to provide valid conclusions. (WK8)

PO5 – 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. (WK2 and WK6)

PO6 – The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

PO7 – Ethics: Apply ethical principles and commit to professional ethics, responsibilities, and norms of engineering practice. (WK9)

PO8 – Individual and Collaborative Team Work: Function effectively as an individual and as a member or leader in diverse/multi-disciplinary teams.

PO9 – 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.

PO10 – Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects in multidisciplinary environments.

PO11 – 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, critically thinking in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSO)

PSO1. Apply the knowledge gained in Mechanical Engineering for design and development and manufacture of engineering systems.

PSO2. Apply the knowledge acquired to investigate research-oriented problems in mechanical engineering with due consideration for environmental and social impacts.

PSO3. Use the engineering analysis and data management tools for effective management of multidisciplinary projects**.**