

## MECHANICAL ENGINEERING

### Program Outcomes of Mechanical Engineering:

Students are expected to have developed the following outcomes at the end of the B.Tech (Mechanical Engineering) program

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, review 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 for complex problems.
5. **Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including predication and modeling 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 setting.
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 members 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 lifelong learning in the broadest context of technological change.

### Programme Educational Objectives (PEOs)

The educational objectives of **Mechanical Engineering** are:

- ❖ **PEO1:** To promote successful career in engineering and technological organizations

and in other industries with the emphasis in the fields of Design, Engineering, Manufacturing, Service and R&D.

- ❖ **PEO2:** To prepare students for higher studies and research in institutes of national importance and developed countries by providing strong fundamentals in basic sciences and applying them in engineering.
- ❖ **PEO3:** Entrepreneurial skill and self-employment in the program adopted.
- ❖ **PEO4:** Working with ethical values in diverse culture and adherence to Indian culture without compromise in the profession is promoted.
- ❖ **PEO5:** Institutional program prepares for total development of personality encouraging cultural events, sports, social activities etc.

#### **Program-specific Outcomes (PSOs):**

Students should be able to

1. Apply the fundamentals of science, engineering and technological knowledge to identify, formulate, design, investigate and solve complex engineering problems of mechanical systems, Thermo-fluidic systems, and fabrication upto micro domain; and realize the dream of India to establish world class technological facilities.
2. Apply appropriate techniques and modern engineering hardware and software tools in the design and integration of mechanical system, to engage in lifelong learning for the advancement of technology and its adaptation in multi-functional environments.

#### **Programme Outcome (PO's) of M.Tech in Engineering Design:**

- ❖ An ability to independently carry out research /investigation and development work to solve practical problems related to Engineering design.
- ❖ An ability to write and present a substantial technical report/document
- ❖ Students should be able to demonstrate a degree of mastery over the area of Engineering design. The mastery should be at a level higher than the requirements in the appropriate bachelor program

#### **Programme Educational Objectives (PEOs) of PG in Engineering Design**

- ❖ A commitment to lifelong learning, quality and continuous improvement through the clear ability to assume increasing levels of technical and/or management responsibility.
  - ❖ Leadership and participation in teams that act as change agents and innovators in product design organizations.
  - ❖ The ability to drive the design of products, design effective and efficient new production processes and improve the performance of existing operations.
- To develop effective technical communication.