

## CHEMICAL ENGINEERING

### Program Outcomes of Chemical Engineering:

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

1. **PO 1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **PO 2: Problem analysis:** Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles mathematics, natural sciences and engineering sciences.
3. **PO 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. **PO 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. **PO 5: Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **PO 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. **PO7: Environment and sustainability:** Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **PO8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **PO 9: Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **PO10: 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. **PO11: 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. **PO12: 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 to technological change.

### Programme Educational Objectives (PEOs)

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

- ❖ **PEO 1:** Contribute towards the Nation's development through their ability to solve diverse and complex problems related to Chemical Processes and Energy Industries across divergent manufacturing methods.
- ❖ **PEO 2:** Pursue their careers in Research and Development, Design / Consultancy organizations, industries, higher education, and entrepreneurship.
- ❖ **PEO 3:** Adopting changing scenarios of rapid technological advances and innovations with the drive to solve large societal problems.

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

Students should be able to

- ❖ **PSO 1:** Ability to apply appropriate simulation techniques for optimization and integration of chemical processes.
- ❖ **PSO 2:** Inculcating attitude to accept global challenges and apply chemical engineering knowledge for solving engineering problems related to core and interdisciplinary fields.

**CIVIL ENGINEERING**

**Program Outcomes of Civil Engineering:**

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

- 1. Engineering knowledge:** Graduates can apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to Civil Engineering related problems.
- 2. Problem analysis:** An ability to identify, formulate, review research literature, and analyze Civil engineering problems reaching substantiated conclusions using principles of mathematics and engineering sciences.
- 3. Design/development of solutions:** An ability to plan, analyze, design, and implement engineering problems and design system components or processes to meet specified needs.
- 4. Conduct investigations of complex problems:** An ability to 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:** An ability to apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:** An ability to apply contextual knowledge to assess societal, and legal issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** An ability to understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** An ability to apply ethical principles and commit to professional ethics, responsibilities, and norms of the engineering practice.
9. **Individual and team work:** An ability to function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings to accomplish a common goal.
10. **Communication:** An ability to communicate effectively on engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, and make effective presentations
11. **Project management and finance:** Ability to 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:** An ability to engage in independent and life-long learning in the broadest context of technological change.

### **Programme Educational Objectives (PEOs)**

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

- ❖ **PEO1** To impart science-based engineering education to develop professional skills that will prepare the students for immediate employment in relevant branch of engineering in industry as against the model that just prepares them for post-graduate education.
- ❖ **PEO2** To develop human potential to its fullest extent so that intellectually capable and imaginatively gifted leaders can emerge in range of professions.
- ❖ **PEO3** To develop among students the awareness of and the competence to be savvy users of information technology.
- ❖ **PEO4** To develop among students the ability to work with others, in professional and social settings.
- ❖ **PEO5** To develop a global view among students so that they can appreciate diversity in the world and in intellectual pursuits and the desire and ability to keep learning throughout life.

### **Program-Specific Outcomes (PSOs)**

1. Development of professional skills in the area of Structural Engineering, Water Resources Engineering, Transportation Engineering, Environmental Engineering,

Geotechnical Engineering, Geo-informatics & Remote sensing, and Construction techniques & management.

2. Application of relevant aspects of mathematics in engineering analysis and design.
3. Refurbishing of technical communication skills.
4. Application of these principles and practices to problems related to Civil Engineering and other allied technical & industrial fields.

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

- ❖ **PO1:** Demonstrate skill for planning, design, construction, and maintenance of transportation projects.
- ❖ **PO2:** Assessment of environmental and its allied issues to the construction of the transportation projects
- ❖ **PO3:** Demonstrate skills to use modern engineering tools, software and equipment to analyze problems and evolve solutions
- ❖ **PO4:** To enhance communication skills and successfully apply research aptitude among students to R &D activities and consultancy works.

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

The educational objectives of the postgraduate program in Transportation Engineering are:

- ❖ **PEO1:** To have a thorough knowledge of planning, design, construction, maintenance, upgradation, and operation of the highways/Transportation Infrastructure
- ❖ **PEO2:** To develop innovative capability among students using modern equipment and the latest software so as to inculcate in them the ability to participate in creative and integrative activities in their relevant branch.
- ❖ **PEO3:** To create research aptitude among the students in the field of transportation engineering and its interdisciplinary areas.

## COMPUTER SCIENCE AND ENGINEERING

### Program Outcomes of Computer Science and Engineering:

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

1. **PO1-Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **PO2-Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using the first principles of mathematics, natural sciences, and engineering sciences.
3. **PO3-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 public health and safety, and cultural, societal, and environmental considerations.
4. **PO4-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. **PO5-Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **PO6-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. **PO7-Environment and sustainability:** Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **PO8-Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **PO9-Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **PO10-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. **PO11-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. **PO12-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.

### Programme Educational Objectives (PEOs)

The educational objectives of **Computer Science and Engineering** are:

- ❖ **PEO1:** High-level attainment of key principles and practices of computation, mathematics and basic principles of engineering to ensure that graduates are able to apply their software development skills in design and implementation of practical systems consisting of software and/or hardware components.
- ❖ **PEO2:** Analyze real-life problems and impart science-based engineering education to develop professional skills that will prepare the students for immediate employment in the industry. Graduates will be actively engaged in learning, understanding, design and applying new ideas and technologies as the field evolves along with participation in creative, synthetic and integrative activities of the relevant branch of engineering.
- ❖ **PEO3:** Excellence in professionalism, moral and ethical conduct, understanding of social context and interpersonal skills with adaptable communication to develop a global view among graduates so that they can appreciate diversity in the world and in intellectual pursuits.

#### **Programme-Specific Outcomes (PSOs):**

Students should be able to

- ❖ **PSO1:** Apply the fundamentals of mathematics, science and engineering knowledge to understand, analyze and develop computer programs in the areas related to algorithms, multimedia, big data analytics, machine learning, artificial intelligence and networking for efficient design of computer-based systems of varying complexity.
- ❖ **PSO2:** Apply appropriate techniques and modern engineering hardware and software tools for the design and integration of computer system and related technologies, to engage in lifelong learning for the advancement of technology and its adaptation in multi-disciplinary environments.
- ❖ **PSO3:** Implementation of professional engineering solutions for the betterment of society keeping the environmental context in mind, be aware of professional ethics and be able to communicate effectively.

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

- ❖ **PO1:** An ability to independently carry out research/investigation and development work to solve practical problems.
- ❖ **PO2:** An ability to write and present a substantial technical report/document.
- ❖ **PO3:** Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.

#### **Programme Educational Objectives (PEOs) of PG in Computer Science and Engineering**

- ❖ **PEO 1:** To develop professionals with strong theoretical fundamentals and practical skills.
- ❖ **PEO 2:** To enable graduates to acquire research and development competence to sustain in academia, research, and industry.
- ❖ **PEO 3:** To keep abreast with the latest area & Research in Computer Science and Engineering and its applications in all allied areas, particularly, artificial intelligence and Machine learning.

## ELECTRICAL ENGINEERING

### Program Outcomes of Electrical Engineering:

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

1. **PO1:Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **PO2: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. **PO3: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. **PO4: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. **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.
6. **PO6: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. **PO7: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. **PO8:Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **PO9:Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **PO10: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. **PO11: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. **PO12: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.

### **Programme Educational Objectives (PEOs)**

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

- ❖ **PEO1:** To impart electrical engineering oriented knowledge in fundamentals of power system, control systems, power electronics, electrical machines etc. in order to solve the electrical engineering problems.
- ❖ **PEO2:** To prepare graduates who will be employable in the diversified sections of industry, government organizations, public sector and multinational corporations and/or pursue higher education in electrical engineering or other fields of their interests.
- ❖ **PEO3:** To make graduates implement their attained knowledge into the practical applications of diverse domains in electrical engineering.
- ❖ **PEO4:** To develop among graduates the ability to create and analyze the solutions to real life problems with novel products.
- ❖ **PEO5:** To equip graduates with electrical in-depth education, so that they become responsible technologists.

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

- ❖ **PSO 1:** Apply the fundamentals of mathematics, science and engineering knowledge to identify, formulate, design and investigate complex engineering problems of electric circuits, analog and digital electronics circuits, control systems, electrical machines and Power system.
- ❖ **PSO 2:** Apply the appropriate techniques and modern engineering hardware and software tools in electrical engineering to engage in life-long learning and to successfully adapt in multi-disciplinary environments.
- ❖ **PSO 3:** Aware of the impact of professional engineering solutions in societal, environmental context, professional ethics and be able to communicate effectively.
- ❖ **PSO 4:** Produce rich aspirants of electrical engineers by imparting them electrical engineering concepts and the practical implementation in the form of projects.
- ❖ **PSO 5:** Design and analyze the novel solutions to the real life problems related to power grids, renewable energy systems, microgrids, electric vehicles, electro-mechanical devices and electronic circuitry.



## ELECTRONICS AND COMMUNICATION ENGINEERING

### Program Outcomes of Electronics and Communication Engineering:

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

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, to the solution of Electronics & Communication engineering problems.
2. **Problem analysis:** Identify, formulate, review, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics and engineering sciences.
3. **Design/development of solutions:** Design solutions for engineering problems and design of system components or processes that meet the desired specifications.
4. **Conduct investigations of complex problems:** Analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Apply appropriate techniques, resources, and modern engineering and IT tools to various engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the background knowledge to assess societal issues and the resulting responsibilities to the professional Electronics engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in 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.

### **Programme Educational Objectives (PEOs)**

The educational objectives of **Electronics and Communication Engineering** are:

- ❖ To prepare the students with strong engineering knowledge and technical competence to use techniques skills that allow them to work effectively as electronics and communication engineers.
- ❖ Graduates will be successfully employed in the industry, and will be actively engaged in learning, understanding, and applying new ideas and technologies, or be actively pursuing graduate studies in relevant branch of Electronics & Communication.
- ❖ To impart hands on knowledge and develop design capability among students so that they have ability to participate in creative activities of the Electronics & Communication engineering.
- ❖ To inculcate interpersonal skills, team work capabilities, communication skills, leadership and awareness of the social, ethical and legal responsibilities leading to lifelong learning and career development.

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

Students should be able to

1. Design an electronic system, component, or process to meet desired needs within realistic constraints.
2. Use the techniques, skills, and modern engineering tools necessary for engineering practice in inter disciplinary area.

## **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.

## **METALLURGY AND MATERIALS ENGINEERING**

### **Program Outcomes of Metallurgy and Materials Engineering:**

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

1. **PO1 Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **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.
3. **PO3 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. **PO4 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. **PO5 Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **PO6 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. **PO7 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. **PO8 Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **PO9 Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **PO10 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. **PO11 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. **PO12 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.
13. **Programme Specific Outcomes (PSOs)**
14. **PSO1:** Professionally empowering the student as technical manpower in the industry or as an entrepreneur for production analytics and innovations.

15. **PSO2:** Able to apply the engineering knowledge to suit the present-day requirements of industry and academia.

### **Programme Educational Objectives (PEOs)**

The educational objectives of **Metallurgy and Materials Engineering** are:

- ❖ Graduates will have a thorough knowledge of the key principles and practices in the field of Metallurgical and Materials Engineering and will have applied their materials development skills and knowledge of foundation principles to the design and implementation of practical systems.
- ❖ Graduates will be successfully employed in the core field of Metallurgical and Materials industry and will be actively engaged in learning, understanding and applying new ideas and technologies as the field evolves; or will have successfully completed, or is actively pursuing, graduate studies in Metallurgical and Materials Engineering.
- ❖ To impart science-based engineering education to develop professional skills that will prepare the students for immediate employment in the Metallurgical and Materials branch of engineering in industry, as against the model that just prepares them for post-graduate education.
- ❖ To develop the design capability among students so that they have the ability to participate in creative, synthetic and integrative activities in the field of Metallurgical and Materials Engineering.
- ❖ To develop among students breadth of knowledge so that they have familiarity with many important technical areas in other branches of engineering and, in-depth knowledge of one or more specializations to cater industry and research.
- ❖ To develop communication skills so that the students are able to express ideas clearly and persuasively, in written and oral forms.
- ❖ To develop among students the awareness of, and the competence to be savvy users of information technology.
- ❖ To develop the ability to design and perform experiments in the field of Metallurgical and Materials Engineering, and to acquire the ability to interpret and evaluate experimental results.
- ❖ To develop among students the ability to work with others, in professional and social settings with curiosity, desire and ability to keep learning through life. Also, to develop an understanding among students of the human, social and business context in which they will utilize their engineering skills.
- ❖ To develop a global view among students so that they can appreciate diversity in the world and in intellectual pursuits

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

Students should be able to

**PSO1:** Professionally empowering the student as technical manpower in the industry or as an entrepreneur for production analytics and innovations.

**PSO2:** Able to apply engineering knowledge to suit the present-day requirements of industry and academia.

**Programme Outcome (PO's) of M.Tech in Advanced Materials and Manufacturing Technology:**

- ❖ Ability to apply the knowledge to design new materials/improve the existing materials, and to optimize manufacturing methods.
- ❖ Ability to understand and exploit the recent advancements in the field of materials science & technology for the betterment of society.
- ❖ Ability to independently carry out research in niche areas of materials & manufacturing technology
- ❖ Ability to undertake challenging projects in space science & technology to meet the future requirements of society.

**Programme Educational Objectives (PEOs) of PG in Advanced Materials and Manufacturing Technology**

- ❖ To provide a strong foundation in materials science & technology and understand how to tailor materials properties.
- ❖ To familiarize with the recent advancements in the field of materials & manufacturing technology.
- ❖ To impart capacity to solve new problems, learn continually and to motivate towards materials innovation.
- ❖ To train high quality human resources to cater to the needs of space research and society at large