



# POORNIMA

## COLLEGE OF ENGINEERING

Promoted by Shanti Education Society, Affiliated to Rajasthan Technical University & Approved by AICTE

### **VISION, MISSION, PEOs, POs AND PSOs OF DEPARTMENTS AND PROGRAMMES**

#### **1. DEPARTMENT OF COMPUTER ENGINEERING**

**Vision:** Evolve as a centre of excellence with wider recognition and to adapt the rapid innovation in Computer Engineering.

**Mission:**

- [1] To provide a learning-centered environment that will enable students and faculty members to achieve their goals empowering them to compete globally for the most desirable careers in academia and industry.
- [2] To contribute significantly to the research and the discovery of new arenas of knowledge and methods in the rapid developing field of Computer Engineering.
- [3] To support society through participation and transfer of advanced technology from one sector to another.

#### **(A) B. TECH. (COMPUTER ENGINEERING)**

##### **Program Educational Objectives (PEOs):**

**PEO1:** Graduates will work productively as skillful engineers playing the leading roles in multifaceted teams.

**PEO2:** Graduates will identify the solutions for challenging issues inspiring the upcoming generations leading them towards innovative, creative, and sophisticated technologies.

**PEO3:** Graduates will implement their pioneering ideas practically to create products and the feasible solutions of research oriented problems.

##### **Program Outcomes (POs):**

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

**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.

**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.

**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.

**PO5: Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools prediction and modelling to complex engineering activities with an understanding of the limitations.

**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.

**PO7: Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and the need for sustainable development.

**PO8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9: Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**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 receive clear instructions.

**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 team, to manage projects and in multidisciplinary environments.

**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.

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

**PSO1:** The ability to understand and apply knowledge of mathematics, system analysis & design, Data Modelling, Cloud Technology, and latest tools to develop computer based solutions in the areas of system software, Multimedia, Web Applications, Big data analytics, IOT, Business Intelligence and Networking systems.

**PSO2:** The ability to understand the evolutionary changes in computing, apply standards and ethical practices in project development using latest tools & Technologies to solve societal problems and meet the challenges of the future.

**PSO3:** The ability to employ modern computing tools and platforms to be an entrepreneur, lifelong learning and higher studies.

## **2. DEPARTMENT OF ADVANCE COMPUTING**

**Vision:** Become most preferred department for the latest advanced computing programs through creating appropriate teaching-learning and skill up gradation environment that fulfill current industry needs.

**Mission:**

- [1] To create experiential learning environment that will enable students to compete globally in advanced computing domain.
- [2] To adapt latest technological tools and contribute significantly for the advancement of knowledge in computer engineering application in industry, society and environment.
- [3] To inculcate essential characteristic in the students for their all-round professional development, interaction with industry and society and lifelong learning.
- [4] To create R & D infrastructure and centre of excellence in various advanced computing sub domains.

### **(A) B. TECH. (COMPUTER SCIENCE AND ENGINEERING (ARTIFICIAL INTELLIGENCE))**

**Program Educational Objectives (PEOs):**

**PEO1:** Gradates will exhibit knowledge and expertise to design and develop solution for complex engineering problem of industry and society efficiently using Artificial Intelligence.

**PEO2:** Gradates will be able to occupy lead position through their problem solving skills and life-long learning ability.

**PEO3:** Gradates will have strong professional ethics, social & moral values, entrepreneurial ability and interaction with society & industry.

**Program Outcomes (POs):**

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

**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.

**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.

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**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.

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

**PSO1:** Apply the knowledge of Artificial Intelligence, machine learning, Human Computer Interaction in any societal, industrial and environmental application.

**PSO2:** Demonstrate skills to design, develop and investigate complex real time problems using AI and its tools by working individual or in groups as a leader or member of the team following professional ethics and human values.

**PSO3:** Adapt, analyze, investigate the problems and provide solutions for interdisciplinary problems using modern and advanced AI tools and techniques possessing lifelong learning ability.

## **(B) B. TECH. (ARTIFICIAL INTELLIGENCE (AI) AND DATA SCIENCE)**

### **Program Educational Objectives (PEOs):**

**PEO1:** Gradates will exhibit expertise in the field of Artificial Intelligence & Data Science applications in the industries occupying lead position to deal with societal and environmental issues.

**PEO2:** Gradates will possess good interaction ability in team and as individual with life-long learning ability to resolve societal problem using AI & DS.

**PEO3:** Gradates will exhibit commitment towards the society and industry with high professional ethics and moral values

### **Program Outcomes (POs):**

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

**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.

**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.

**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.

**PO5: Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools prediction and modelling to complex engineering activities with an understanding of the limitations.

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**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.

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

**PSO1:** Apply knowledge of AI and data science in developing intelligent and context-aware applications/systems/ processes to facilitate industry and Society.

**PSO2:** Demonstrate skills to learn, adapt and utilize various technologies and the tests for development of AI and Data Science based solutions to environmental/ societal and industry problems.

**PSO3:** Analyze and interpret huge and complex data individually and in team for development of sustainable solution possess ethical behavior/ critical thinking and lifelong learning.

### **(C) B. TECH. (COMPUTER SCIENCE AND ENGINEERING (CYBER SECURITY))**

### **Program Educational Objectives (PEOs):**

**PEO1:** Gradates will have expertise in protecting and securing the data and information using the cyber security concepts, tools & technologies.

**PEO2:** Gradates will possess strong technical and entrepreneur skills to secure IT frameworks and carryout risk analysis with life-long learning ability.

**PEO3:** Gradates will possess good communication skills while interacting with industry and society to protect the data and information with significant knowledge and implementation skills of cyber laws, professional ethics and leadership attributes.

### **Program Outcomes (POs):**

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

**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.

**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.

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**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.

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

**PSO1:** Apply fundamental knowledge of computer science engineering including software development and testing, application design, development and deployment using artificial intelligence, tools and techniques for social, industrial and environmental applications.

**PSO2:** Understand, design, development and deployment of Cyber Security solution to various emerging threats in using mobile and internet base technologies and tools.

**PSO3:** Work individually and in team with the good communication skill, ethical behavior and develop completed and sustainability solution for cyber security and other computer security domain issues related to industry and society.

### **3. DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**Vision:** To establish an acknowledged Department of academics in the field of Electronics and Communication Engineering

**Mission:**

- [1] To equip the students with strong foundations to enable them for continuing education in the field of Electronics and Communication Engineering.
- [2] To provide quality education & to make the students entrepreneur and employable.
- [3] To undertake research and development in the field of Electronics and Communication Engineering.

#### **(A) B. TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)**

**Program Educational Objectives (PEOs):**

**PEO1:** The graduates will be competent enough to apply knowledge and skills to solve the real time problem.

**PEO2:** Graduates will work as a team in diverse field and gradually move into leadership position.

**PEO3:** Graduates will understand current professional issues, apply latest technologies and come out with innovative solutions for the betterment of the society.

**Program Outcomes (POs):**

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

**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.

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**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.

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

**PSO1:** Graduates possesses the ability to understand and apply basic knowledge of core Electronics & Communication Engineering for the benefit of society.

**PSO2:** Graduates will be proficient to apply electronic modern IT tools for the design and analysis of complex electronic systems in furtherance to research activities.

**PSO3:** The ability to be adaptable to the multidisciplinary nature at workplace, develop excellent Interpersonal Skills & Leadership qualities that benefits the individual & organization.

## 4. DEPARTMENT OF CIVIL ENGINEERING

**Vision:** To become a globally recognized centre of civil engineering through excellence in technical education, interdisciplinary research and innovation.

**Mission:**

- [1] To develop the professional skills with outstanding knowledge.
- [2] To enhance research & development in emerging areas of civil engineering.
- [3] Enhancing linkages with alumni and industry.
- [4] To produce ethically able, humane and creative global leaders.

### (A) B. TECH. (CIVIL ENGINEERING)

**Program Educational Objectives (PEOs):**

**PEO1:** Graduates will able to apply fundamental principles of science, mathematics and engineering using modern tools to solve the societal and environmental problems.

**PEO2:** Graduates will able to use their practical, field survey, computer and analytic skills to build industry ready engineers to solve multi-disciplinary sustainable projects.

**PEO3:** Graduate applies innovative ideas to improve the technical competency in engineering decisions, lifelong learning, to equip leadership qualities in diverse teams, promote and practice appropriate ethical moral to become professional engineers.

**Program Outcomes (POs):**

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

**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.

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**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.

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

**PSO1:** The graduates will have the ability to plan, design and quality execution of construction projects.

**PSO2:** The graduates will have the ability to solve problems in the structural, construction management, geotechnical, transportation and environmental disciplines of civil engineering.

**PSO3:** Graduates will be able to cognizance of social awareness, interdisciplinary aspects and environmental necessity along with ethical responsibility to have a successful career and to become an entrepreneur.

## 5. DEPARTMENT OF ELECTRICAL ENGINEERING

**Vision:** To be a model of excellence in Professional Education and Research by creating electrical engineers who are prepared for lifelong engagement in the rapidly changing fields and technologies with the ability to work in team.

### **Mission:**

- [1] To provide a dynamic environment of technical education wherein students learn in collaboration with others to develop knowledge of basic and engineering sciences.
- [2] To identify and strengthen current thrust areas based upon informed perception of global societal issues in the electrical and allied branches.
- [3] To develop human potential with intellectual capability who can become a good professional, researcher and lifelong learner.

### **(A) B. TECH. (ELECTRICAL ENGINEERING)**

#### **Program Educational Objectives (PEOs):**

**PEO1:** Graduates will have the ability to formulate, analyze and apply design process using the basic knowledge of engineering and sciences to solve complex electrical engineering problems.

**PEO2:** Graduates will exhibit quality of leadership, teamwork, time management, with a commitment towards addressing societal issues of equity, public and environmental safety using modern engineering tools.

**PEO3:** Graduates will possess dynamic communication and have successful transition into a broad range of multi-disciplinary career options in industry, government and research as lifelong learner.

#### **Program Outcomes (POs):**

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

**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.

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**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.

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

**PSO1:** Graduate possesses the ability to apply fundamental knowledge of basic sciences, mathematics and computation to solve the problems in the field of electrical engineering for the benefit of society.

**PSO2:** Graduate possesses the ability to professionally communicate and ethically solve complex electrical engineering problems using modern engineering tools.



**PSO3:** Graduate possesses sound fundamental knowledge to be either employable or develop entrepreneurship in the emerging areas of renewable and green energy, electric and hybrid vehicles and smart grids and shall be susceptible to life- long learning.

## **6. DEPARTMENT OF INFORMATION TECHNOLOGY**

**Vision:** To attain distinction in education to enable students for their establishment as globally competent professional and empowering them with proficiency, knowledge and research ability required to be successful in field of Information Technology.

### **Mission:**

- [1] To provide state-of-the-art facilities with modern IT tools to students and faculty thereby enabling them to develop sustainable solutions for real world problems.
- [2] To create and propagate knowledge in field of Information Technology through research, teaching and learning for meeting societal challenges.
- [3] To inculcate analytical, leadership and team working skills with ethical behavior in students and provide an environment for continuous learning.

### **(A) B. TECH. (INFORMATION TECHNOLOGY)**

#### **Program Educational Objectives (PEOs):**

**PEO1:** Graduates will perform effectively as individuals and team members of multidisciplinary projects to create innovative and sustainable solutions for societal problems, meeting with global challenges and emerging trends.

**PEO2:** Graduates will possess core competence in Information Technology and allied engineering fields thereby maintaining the leading positions in industry and/ or excel in higher studies.

**PEO3:** Graduates will exhibit professionalism, ethical attitude, communication ability, spirit of entrepreneurship and adapt to current advancements through research ability and lifelong learning.

#### **Program Outcomes (POs):**

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

**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.

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**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.

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

**PSO1:** Analyze, design and develop efficient algorithms and software applications to deploy in secure network enabled environment meeting ever changing societal needs in economically acceptable terms.

**PSO2:** Comprehend and apply knowledge of contemporary areas in Information Technology viz. Cloud based technologies, Machine Learning, Data Analytics, IOT and Network and Cyber Security to develop creative software solutions for automation of various industrial requirements.

**PSO3:** Exhibit familiarity and practical competence in modern programming languages and open source platforms so as to develop innovative projects related to business applications.

## 7. DEPARTMENT OF MECHANICAL ENGINEERING

**Vision:** To be recognized for quality education in the field of Mechanical Engineering and identified for its innovation & excellence.

**Mission:**

- [1] To provide education that transforms students through rigorous teaching and thought process to fulfill the needs of the society and industry
- [2] To collaborate with leading industry partners and other academic & research institutes around the world to strengthen the education and research ecosystem.
- [3] To prepare students with life-long learning for their career by fostering in them the ethical & technical capabilities pertinent to mechanical & allied engineering.

### (A) B. TECH. (MECHANICAL ENGINEERING)

**Program Educational Objectives (PEOs):**

**PEO1:** Graduate will have Fundamental & multidisciplinary knowledge with an ability to analyze, design, innovates and handles the realistic problems.

**PEO2:** Graduate will possess ethical conduct, sense of responsibility to serve society and protect the environment.

**PEO3:** Graduate will have strong foundation in academics, leadership qualities and lifelong learning for a prosperous professional career.

**Program Outcomes (POs):**

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

**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.

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

**PSO1:** Design, analyze and innovate solutions to technical issues in Thermal, Production and Design Engineering.

**PSO2:** Exhibit the knowledge and skills in the field of Mechanical & Allied engineering concepts.

**PSO3:** Apply the knowledge of skills in HVAC&R and Automobile engineering.