Mukesh Patel School of Technology Management and Engineering

B.Tech (Computer Engineering)

- **Program Educational Objectives (PEOs)**
- **Program Outcomes (POs)**
- **Course Outcomes (COs)**

Program Educational Objectives (PEOs):

1. **Professional Skills**
2. **Career Growth**
3. **Higher Studies**

Program Outcomes (POs):

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

PO-2: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO-3: 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

PO-4: 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

PO-5: 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.

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

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

PO-8: Apply ethical principles and commit to professional ethics, responsibilities, and norms of engineering practice.

PO-9: Function effectively as an individual , and as member or leader in diverse teams , and in multidisciplinary settings

PO-10: Communicate effectively on complex engineering activities with the engineering community and with the 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.

PO-11: 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

Courses and Course Outcomes (COs):

Probability and Statistics

- **CO-1:** Solve problems involving random variables, probability distributions and testing of hypothesis, correlation and regression.
- **CO-2:** Identify suitable probability distribution and testing techniques to solve problems.
- **CO-3:** Apply knowledge of random variables, probability distributions, measures of central tendency, correlation and regression to solve real life problems
- **CO-4:** Analyse data samples using statistical methods.

Constitution of India

- **CO-1:** Recall the historical evolution of India's democratic values, emphasizing the foundational principles of justice, equality, and liberty as enshrined in the Preamble of the Constitution.
- **CO-2:** Understand the fundamental rights enshrined in the Constitution, their permissible restrictions, and how these rights are balanced with duties, to grasp their application within societal and professional frameworks.
- **CO-3:** Apply the knowledge of the structure of India's polity and the role of the Judiciary in maintaining the basic structure of the Constitution in real-world professional contexts

Discrete Mathematics

- **CO-1:** define and relate basic notions of discrete mathematics.
- **CO-2:** demonstrate the ability to understand mathematical logic, concepts in abstract algebra and mathematical proof techniques.
- **CO-3:** solve problems based on combinatorics, graph theory and abstract algebra.
- **CO-4:** demonstrate understanding of the applications of algebra, combinatorics, and graph theory.

Critical Thinking

- **CO-1:** solve problems or take decisions by processing information in a clear, logical, reasoned and reflective manner.
- **CO-2:** recognise, build and appraise arguments
- **CO-3:** analyse contexts effectively
- **CO-4:** recognise bias and its impact on decision making

Elements of Biology

- **CO-1:** Identify the principles of biomimicry and explain their applications in engineering and sustainable design, demonstrating an understanding of biologically inspired solutions.
- **CO-2:** Classify the fundamental building blocks of life (carbohydrates, proteins, lipids, and nucleic acids) and describe their structural and functional roles in cellular processes and metabolism.
- **CO-3:** Explain the molecular basis of genetic information transfer, including DNA replication, transcription, and translation, and interpret Mendel's laws and their significance in genetics.
- **CO-4:** Describe the mechanisms of enzyme action, enzyme-substrate interactions, and enzyme inhibition, and discuss their industrial and biological applications.
- **CO-5:** Explain the principles of metabolism and energy transactions, and categorize microorganisms based on their characteristics, growth kinetics, and applications in biotechnology and drug discovery.

English Communication

- **CO-1:** Use their knowledge of vocabulary and grammar to articulate their ideas effectively
- **CO-2:** Demonstrate effective listening and speaking skills in oral communication situations such as speeches, conversations, power-presentations, etc.
- **CO-3:** Apply different reading techniques as needed to read passages effectively

Design and Analysis of Algorithms

- **CO-1:** Understand the space-time complexity of an algorithm
- **CO-2:** Evaluate divide and conquer approach of algorithm design
- **CO-3:** Apply greedy technique of algorithm design
- **CO-4:** Analyze dynamic programming and Backtracking algorithm design paradigm.

Image and Video processing

- **CO-1:** Apply image enhancement and image transform techniques on images.
- **CO-2:** Implement morphology operations to highlight objects
- **CO-3:** Analyze effect of various edge detection and segmentation techniques on images
- **CO-4:** Comprehend fundamentals of video processing

Technical Communication

- **CO-1:** Apply the fundamentals of written communication to create written documents that are coherent, error-free and well organized.
- **CO-2:** Develop the ability to create effective and persuasive business correspondence, such as letters and emails, that follow etiquette and are able to achieve the desired outcomes.
- **CO-3:** Create basic reports such as memo, letter and survey-based report, using their understanding of report writing.

Deep Learning

- **CO-1:** Explain the fundamentals of deep learning.
- **CO-2:** Apply optimization and regularization for tuning the parameters of deep neural networks.
- **CO-3:** Build convolutional neural network architectures for various applications.
- **CO-4:** Apply recurrent neural network architectures for various applications.