



Mukesh Patel School of Technology Management and Engineering

B Tech Computer Science & Engineering (Data Science)

- **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

PO-12: 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.

Courses and Course Outcomes (COs):

Communication Skills I

- **CO-1:** Draft formal and academic documents as per the standard principles of written communication.
- **CO-2:** Engage in effective oral communication in both formal and informal communication context.
- **CO-3:** Create formal and persuasive presentation.
- **CO-4:** Comprehend oral and written texts critically.
- **CO-5:** Work effectively in groups with sound understanding of groups dynamics.

Introduction to Business Statistics, Analytics and Modeling-I

- **CO-1:** Understand basic concepts of probability and statistics.
- **CO-2:** Identify suitable probability distribution and testing techniques to solve problems.
- **CO-3:** Analyse real data sets from business environments.

Introduction to Business Statistics, Analytics and Modeling-II

- **CO-1:** Formulate mathematical models for a variety of business applications and solve those using linear programming and optimization techniques
- **CO-2:** Formulate and solve variety of network optimization problems.
- **CO-3:** Apply knowledge of decision making to select the best alternatives.
- **CO-4:** Use forecasting techniques to predict future behavior based on past experiences.

Introduction to Chemistry

- **CO-1:** Explain the foundational knowledge of the subject using chemistry principle
- **CO-2:** Identify newer chemical materials for better product designing.

- **CO-3:** Analyze the impact of science and its progress on society and provide solution for cleaner environment.
- **CO-4:** Evaluate the various aspects of chemistry to convert into useful applications.

Basic Electrical & Electronics Engineering

- **CO-1:** Explain the fundamental concepts of DC circuits, including Kirchhoff's laws and network theorems
- **CO-2:** Interpret the principles of AC circuit analysis, including resonance and three-phase systems
- **CO-3:** Illustrate the working principles of transformers and different types of electrical machines
- **CO-4:** Explain the basic operation of analog electronic components, including rectifiers, transistors and operational amplifiers.
- **CO-5:** Make use of logic gates and Boolean expressions for digital circuits.

Data Structures and Algorithms

- **CO-1:** Understand the concept of data structures and computational complexity
- **CO-2:** Identify and implement appropriate linear data structure for the given problem.
- **CO-3:** Identify and implement appropriate non-linear data structure for the given problem.
- **CO-4:** Differentiate various searching and sorting algorithms.

Communication Skills II

- **CO-1:** Communicate effectively in different range of situations with respect to cultural contexts.
- **CO-2:** Conduct academic inquiry and present their findings in the form of formal reports, case-study responses
- **CO-3:** Follow ethical practices underlying academic work
- **CO-4:** Participate effectively in professional networks

- **CO-5:** Communicate through written and oral means of communication in professional and academic settings effectively

Distributed Computing

- **CO-1:** Explain the basic concepts of distributed computing.
- **CO-2:** Apply the concepts of distributed computing to implement various mechanisms of communication
- **CO-3:** Analyze various approaches of synchronization, Mutual exclusion, Election algorithms, and fault-tolerant services.
- **CO-4:** Recognize different kinds of naming and their implementation.

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.

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

Machine Learning

- **CO-1:** Describe requirements of machine learning algorithms
- **CO-2:** Select and regularize linear and nonlinear models
- **CO-3:** Design machine-learning system
- **CO-4:** Apply classification and clustering approaches to extract insight from given dataset

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.