SVKM'S
NMIMS
Deemed to be UNIVERSITY

**Mukesh Patel School of Technology Management and Engineering**

# Integrated(UG) MBA Tech
# (Data Science)

- **Program Outcomes (POs)**
- **Course Outcomes (COs)**

# Program Outcomes (POs):

**PO-1:** Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.

**PO-2:** Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

**PO-3:** Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

**PO-4:** Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).

**PO-5:** Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)

**PO-6:** The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

**PO-7:** Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

**PO-8:** Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

**PO-9:** Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences

**PO-10:** Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

**PO-11:** Life-Long Learning: Recognize the need for, and have the preparation and ability for independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change

# Courses and Course Outcomes (COs):

**Introduction to Data, Signal and Image Analysis**

- **CO-1:** Classify discrete and continuous data signals and learn the engineering mathematical aspect of it and perform operations on it
- **CO-2:** Model finite impulse and infinite impulse response filters
- **CO-3:** Simplify the concepts of Convolution and Sampling to solve and support problems
- **CO-4:** List the fundamental concepts in Image representation and state basic filtering techniques to facilitate noise removal

**Data Driven program analysis**

- **CO-1:** Describe the basic concepts of Data mining and components of Business Intelligence systems
- **CO-2:** Explain classification process and Predict decision tree using ID3 algorithm
- **CO-3:** Calculate frequent item sets and list strong association rule

**Data Wrangling**

- **CO-1:** Find data from a variety of sources into the tool environment. Explain the principles of tidy data, data wrangling and sharing
- **CO-2:** Make use of statistical and basic data analysis tool and fundamental functions for data cleaning and manipulation. Construct datasets and further modify and analyse it
- **CO-3:** Tell the basic terms in data warehousing like metadata, SCD, ETL etc

**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

**Basic Electrical and Electronics Engineering**

- **CO-1:** Interpret DC circuits, theorems and time domain analysis of first order RL circuit,
- **CO-2:** Analyze series and parallel AC circuits and compare star/delta configurations,
- **CO-3:** Comprehend the principles of transformer and electrical machines,
- **CO-4:** Review the construction, working principle and applications of electronics devices and logic circuits

**Workshop**

- **CO-1:** Identify correct testing instruments and tools for various tasks.
- **CO-2:** Build PCB circuits using through hole and SMD components for small applications.
- **CO-3:** Make use of required electrical components for building domestic wiring circuits.
- **CO-4:** Assemble PC hardware and configure network topology.

**Predictive Analysis**

- **CO-1:** Classify Libraries, Diagram and Data structure.
- **CO-2:** Predict classification and regression models.
- **CO-3:** Evaluate and design different statistics for supervised and unsupervised models.

**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.

**Optimization Methods**

- **CO-1:** Use optimization techniques in Data Analytics and related areas.
- **CO-2:** Apply optimization techniques to business problems.
- **CO-3:** Develop and implement basic optimization techniques.

**Database Management System**

- **CO-1:** Describe core concepts of database and model a database management system through ER modeling.
- **CO-2:** Apply knowledge of relational algebra and structured query language to retrieve and manage data from relational database.
- **CO-3:** Demonstrate the use of normalization for database design.
- **CO-4:** Demonstrate the concept of transactions and use modern database techniques such as NoSQL