

B.E. Robotics & Industrial Automation



"Where Robots Work and Ideas Move Industry."

The Robotics and Industrial Automation Engineering programme focuses on the use of advanced technologies to control and automate manufacturing processes. It involves computerized control systems, sensors, other tools that operate and manage machinery and equipment in industrial settings. The field offers numerous advantages including reduced downtime, increased productivity, lower energy consumption and costs, enhanced safety, minimized human errors, simplified maintenance procedures, improved quality, greater consistency and repeatability in processes.

Highlights of B.E. Robotics & Industrial Automation Programme

From smart factories to medical robots and autonomous vehicles, this program prepares you for a future where machines think, act, and transform industries.

- **Manufacturing:** Robots for assembly lines, material handling, and quality control.
- **Healthcare:** Surgical robots, rehab devices, and medical imaging systems.
- **Agriculture:** Automated systems for planting, harvesting, and crop monitoring.
- **Logistics & Transportation:** Warehousing robots, delivery drones, and autonomous vehicles.
- **Aerospace & Defense:** Robots for space missions, underwater research, and military use.
- **Industrial Automation** uses computerized systems, sensors, and control technologies to streamline manufacturing.

CAREER PATHWAYS

The possible career pathways for students graduating with this programme are as follows:

- Robotics/Automation/Mechatronics Engineer
- Robotics Technician
- Robotics Software Engineer
- Field Robotics Engineer
- Controls Engineer.

Related companies in UAE & India are as follows:

- Weidmuller
- Emerson Automation
- Schneider Electric
- Siemens
- Honeywell
- FESTO
- OMRON
- Mitsubishi Electric
- Schindler
- Unique World Robotics
- Digi Robotics
- IQ Robotics
- Reliable Robotics
- Fun Robotics
- Emirates Robotics
- Ameca Robotics
- Micropolis Robotics
- DEWA
- Emirates Airlines
- Techrobotix
- Sentient Lab
- Fractal Systems
- Larsen & Toubro
- Daikin Middle East
- SEMEA Electrical & Automation.

Software Tools:

Python | C++ | MATLAB | ROS | OpenCV | AutoCAD | SOLIDWORKS | Abaqus FEA

B.E. Robotics & Industrial Automation

Semester-wise pattern*

First Semester

I YEAR

- Biology Laboratory
- General Biology
- Chemistry Laboratory
- General Chemistry
- Mathematics I
- Physics Laboratory
- Mechanics, Oscillations and Waves
- Engineering Graphics

Second Semester

- Mathematics II
- Workshop Practice
- Computer Programming
- Electrical Sciences
- Technical Report Writing
- Probability and Statistics
- Thermodynamics

II YEAR

- Mathematics III
- Humanities Electives
- Materials and Mechanics for Robotics
- Introduction to Mechanisms & Robotics
- Foundations of Data Structures and Algorithms
- Sensors, Actuators and Signal Conditioning

- Principles of Economics Or Principles of Management
- Control Systems
- AI for robotics
- Embedded Systems for Robotics
- Signals and Systems
- Environmental Studies

Summer Term: Practice School I

III YEAR

- Open/Humanities Electives
- Fluid Power Systems
- Robot Dynamics & Control
- Computer Vision
- Discipline Electives (Capstone Project-1)

- Open/Humanities Electives
- IoT for Industrial Automation
- Computer aided design
- Autonomous Mobile Robotics
- Industrial Automation & Control
- Discipline Electives (Capstone Project-2)

IV YEAR

- Open Electives
- Discipline Electives

- Practice School-II / Thesis or Thesis Or Thesis (9) and Electives (6 to 9)

* This is an operative pattern for the students as approved by the Senate appointed committee, subject to change if the situation warrants

▪ **Discipline Core Courses - 48 units (15 courses)**

▪ **Humanities Electives - 8 units (3 courses)**

▪ **Discipline Electives - 12 units (4 courses)**

▪ **Open Electives - 15 units (5 courses)**

Discipline Elective Courses

- Data Mining
- User Interfaces
- Deep Learning
- Image Processing
- Machine Learning
- Internet of Things
- Artificial Intelligence
- Real-Time Systems
- Energy Management
- Lean Manufacturing
- Finite Element Methods
- Mechanisms and Robotics
- Introduction to MEMS
- Data Mining in Mechanical Sciences
- Digital Twins in Mechanical Engineering
- Design of Machine Elements
- Engineering Optimization
- Computer Aided Manufacturing
- Additive Manufacturing
- Communication Networks
- Computer based Control Systems
- Medical Instrumentation
- Energy Storage Systems
- Microprocessors and Interfacing
- Modern Communication Technologies
- Real Time Operating Systems
- Virtual Instrumentation
- Advanced Process Control
- Modern Control Systems
- Analog and Digital VLSI Design
- Bio-Inspired Intelligence: Algorithms and Applications
- Data Communications and Networks
- Fuzzy Logic and Applications
- Human Computer Interaction
- Neural Networks and Fuzzy Logic
- Remote Sensing and Image Processing
- Object Oriented Programming
- Foundations of Data Science
- Software Development for Portable Devices
- Software for Embedded Systems
- Autonomous Aerial Vehicles
- Cyber Physical Systems and Security
- Digital Signal Processing
- Industry 4.0 in Manufacturing
- Underwater Robotics
- Autotronics and Vehicle Intelligence