



About the Course

The primary goal of this course is to teach students about the nuances of industrial automation and how it can be applied through digitalization. This course is distinguished by its comprehensive coverage of various robotic configurations for industrial applications, robot design specifications, application-oriented robot programming, and robotic vision systems. It improves the learners' ability to design and build Robots for specific applications.

Digitalization is unavoidable in today's world. Industry 4.0 is critical for integrating manufacturing and business as a whole in order to reduce complexity and decision making. From digital twins to robotic process automation, this course gives insight into the concepts of smart factories and digital transformation. The applications of Product Life Management, ERP, Value Chain Management, and IIoT in industries are thoroughly discussed.



Key Topics

Sensor & Transducers in Machine tools & robots | Electrical, Hydraulic & Pneumatic actuators | Servo systems | Robot Programming| Robot Vision systems | Interfacing | Simulation using Matlab |Digital Transformations |Cyber Physical Systems |Digital Twins & Digital Thread| Robotic Process Automation | Industry 4.0| ERP & Value chain Management| Smart Factory| Additive Manufacturing| IIoT Industrial Applications



Course Objectives

Enables learner to:

- ▶ Describe with various robotic configurations and programming features.
- ▶ Illustrate the critical components of Mechatronics systems, aspects of Robotic Design, and Digitalization
- ▶ Explain the Drivers and Technologies of Digital manufacturing
- ▶ Create Robots for Industrial use

- ▶ Summarize Digital Manufacturing's technical impact
- ▶ Create a smart factory using the use case study as a guide

Learning Outcomes

Upon successful completion of this course, learners will be able to:

- ▶ Analyze Manufacturing Processes & Identify the need for Robotics
- ▶ Assess the Robots for Manufacturing applications
- ▶ Evaluate the feasibility of implementing Digitalization
- ▶ Critically analyze the Robotics in manufacturing applications interface
- ▶ Design project works concerning Robotics and Digitalization
- ▶ Summarize the use of Industry 4.0 as a whole