BASIC INDUSTRIAL ROBOTICS ENGINEER

- ✓ • **What is Industrial Automation?**
- ✓ • **Role of Robots / Robotics in Industrial Automation**
- ✓ • **Evolution of Robots through Ages**
- ✓ • **Robots – Components**
- ✓ • **Functions of Individual Components**
- ✓ • **Types of Applications**
- ✓ • **Groundwork of Industrial Robotics Automation**
- ✓ • **Elements of robots and it functions**
- ✓ • **Applications and EOAT Selection criteria**
- ✓ • **Design of EOAT**
- ✓ • **Robot basic operations**
- ✓ • **Simple Robot Programming**
- ✓ • **Auto cycle running**
- ✓ • **Groundwork of Industrial Robotics Automation**
- ✓ • **Elements of robots and it functions**
- ✓ • **Applications and EOAT Selection criteria**
- ✓ • **Robot Motion Overview**
- ✓ • **Robot Operation overview and Simple Programming**
- ✓ • **Safety and Servicing Guidelines**

ADVANCED INDUSTRIAL ROBOTICS ENGINEER :

- ✓ • **What is Industrial Automation?**
- ✓ • **Role of Robots / Robotics in Industrial Automation**
- ✓ • **Evolution of Robots through Ages**
- ✓ • **Robots – Components**
- ✓ • **Functions of Individual Components**
- ✓ • **Types of Applications**

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- ✓ • **Groundwork of Industrial Robotics Automation**
- ✓ • **Elements of robots and it functions**
- ✓ • **Applications and EOAT Selection criteria**
- ✓ • **Design of EOAT**
- ✓ • **Robot basic operations**
- ✓ • **Simple Robot Programming**
- ✓ • **Auto cycle running**
- ✓ • **Overview of I/O's and another signal**
- ✓ • **Robot Motion setting**
- ✓ • **Robot Mastering Overview**
- ✓ • **Robot Studio Basics and Error Interpretation**
- ✓ • **Advanced Robotics Programming (Pick and Place / Palletizing)**
- ✓ • **Robot interfacing with third party controller**

- ✓ • **Safety and Servicing guidelines**
- ✓ • **All the aforementioned Intermediate Course Content**
- ✓ • **Advanced Robot Programming**
- ✓ • **Tool Calibration and Interfacing**
- ✓ • **Robot interfacing and I/O Configuration**
- ✓ • **Robot Mastering Overview**
- ✓ • **Robot Studio Basics and Error Interpretation**

Basic Robotics

This 30 hour course is designed for participants who wish to learn basic robotic concepts. Students will learn to create a basic robot program and handle a robot using the teach pendant. A simple Hands-On experiment is used to give the participants a through understanding of the basics of industrial robotics.
Duration : 30 Hours
Pre-Requisites : None

Target Audience : 3rd and Final year engineering/diploma students, working professionals, and maintenance engineers.

Course Content
1. What is a Robot?

- **Industrial Robot Vs Academic Robot**

- **Types of Robots – Cartesian, SCARA, 6 axis, Delta**

- **Applications of a Robot**

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2. Specifications of a Robot

- **Payload**
- **Reach**
- **Voltage**
- **Classification**

3. End of Arm Tool

- **Gripper**
- **Types of grippers – Pneumatic, Electric, Vacuum & Electro-Magnetic**
- **Painting Gun**
- **Welding Gun**
- **Fettling Tool**

4. Programming a Fanuc Robot

- **Teach pendant functions**
- **Jogging the robot in different modes (World, Joint, Tool etc.)**
- **Creating and saving a program**
- **Program instructions**
- **Teaching points**
- **Configuring and using Input/Outputs (Digital IO, Robot IO, Interconnect IO)**
- **Running the robot in auto mode for a pick and place application HANDS-ON experiments.**

Advanced Robotics

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This 20 hour course is designed for participants who wish to learn some of the advanced functions of industrial robots such and palletizing and vision systems. 2 **HANDS-ON** experiments are used to impart advanced robotic concepts.

Duration : 20 Hours
Pre-Requisites : Basic PLC & Basic Robotics
Target Audience : 3rd and Final year engineering/diploma students, working professionals, and maintenance engineers.

Course Content

1. Simulation using Fanuc ROBOGUIDE

- Creating a layout for devices
- Creating actual program offline with the same user interface as a teach pendant
- Simulation of robot movements and application commands

2. Interfacing PLC with Robot

- Robot to PLC IO interface through Ethernet IP
- Control the robot from a PLC

3. Palletizing

- Palletizing concepts
- Create a program to pick a component and place in a defined pallet with 3 rows and 4 columns

4. Vision system

- What is a vision system
- Applications of vision
- Programming a vision system
- Integration of vision with Fanuc Robot

HANDS-ON experiments

Experiment 1 – Palletizing

Program a robot to pick components from an part in-feed system and load components to a pallet. Learn to create an array in the robot program and automate the process of palletizing.

Experiment 2 – Vision based pick and palletizing

In addition to palletizing, learn to program a vision system and feed coordinates to a Fanuc robot. Pick components from a moving conveyor and palletize. Control the entire application from PLC.

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