



VELAMMAL COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS), MADURAI



Centre of Excellence

# ROBOTICS AND AUTOMATION



## List of Equipment

| Sr. No. | Equipment Name                                             | Description                                                                                                            |
|---------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 1       | <b>Robot</b> training Set-up with demo application         | Various features of MELCO Slim Robot along with working demo applications - Conveyor pick and place, Sealing, Assembly |
| 2       | <b>Simulation Software</b> - iQ Works Programming Software | Combined Programming software                                                                                          |
| 3       | iQ-R based Integrated <b>Factory Automation(FA)</b> setup  | Various features and functionalities of Servo drives and its Motors, Inverter with advance PLC (iQ-R) system, HMI.     |



## Course Details



| S.No | Course Details                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Duration / Cost <sup>#</sup>                 |                                              |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------|
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Internal                                     | External                                     |
| 1    | <b>Robot Programming:</b><br>The aim of this training is to acquaint the participants with basic concept of programming of the Robot System. This training provide opportunity to learn Operation of Industrial Robot including safety instructions. Training also provide Knowledge and usage of the coordinate systems, Methods of tool calibration and tool payload, basic concepts of robot programming and Robot Simulation on iQ works programming software.         | 05 Days<br>(40 Hours)<br><br>Rs. <u>TBC</u>  | 05 Days<br>(40 Hours)<br><br>Rs. <u>TBC</u>  |
| 2    | <b>Robot Operation &amp; Applications:</b><br>The aim of this 'Workshop on Robot Operation & Applications' is to provide technical insight to Engineering Students about the Operation & Programming of Industrial Robots. During the workshop participants visit the various State of Art facilities available at Center and also witness operation of various Robotic Applications including Material Handling, Arc & Spot Welding, Machining / Milling and 3D Printing. | 05 Days<br>(40 Hours)<br><br>Rs. <u>TBC</u>  | 05 Days<br>(40 Hours)<br><br>Rs. <u>TBC</u>  |
| 3    | <b>Industry Automation:</b><br>This aims to give various features and functionalities of Servo drives and its Motors, Inverter with advance PLC (iQ-R) system. its provides fundamental knowledge on PLC, HMI, SERVO & VFD and how its integrated for factory automation.                                                                                                                                                                                                  | 05 Days<br>(40 Hours)<br><br>Rs. <u>TBC</u>  | 05 Days<br>(40 Hours)<br><br>Rs. <u>TBC</u>  |
| 4.   | <b>Combined course on Robotics &amp; Automation:</b><br>Comprehensive course covering the content of all the above three courses (Robot Programming, Robot operation and application & Industry Automation) along with one day industry visit.                                                                                                                                                                                                                             | 15 Days<br>(120 Hours)<br><br>Rs. <u>TBC</u> | 15 Days<br>(120 Hours)<br><br>Rs. <u>TBC</u> |



## COE - ROBOTICS AND AUTOMATION



**Course Name: Robot Programming**

**Course Code: COE/RA/RP001**

**Objective:**

The aim of this training is to acquaint the participants with basic concept of programming of the Robot System. This training provide opportunity to witness Operation of Industrial Robot including safety instructions. Training also provide Knowledge and usage of the coordinate systems, Methods of tool calibration and tool payload, basic concepts of robot programming and Robot Simulation on iQ works programming software.

**Course Duration: 05 Days (40 Hours)**

**Course Fee: Rs. TBC**

**Course Content:**

1. Safety instruction for the robots
2. Operating of the robot system
3. Knowledge and usage of coordinate systems
4. Methods of tool calibration and tool payload
5. To realise a mastering&To realise a calibrating of a work piece
6. Usage of the navigator, creating programs and archiving of programs
7. Usage of motion programming
8. Insert, delete and manipulate points
9. Limited position correction& Usage of logic and gripper programming
10. Introduction to the expert level
11. Robot Simulation Programming Methods

**Course Outcome:**

- ✓ Understand Importance of robotics in today and future goods production
- ✓ Demonstrate Robot Safety/Awareness of various components of Industrial Robot
- ✓ Understand the principles and the basic functions of Robot
- ✓ Power up, Operate and Jog the Robot independently
- ✓ Create, modify and execute a teach pendant program for Robot operation



### **Course Name: Robot Operation & Applications**

**Course Code:** COE/RA/RP002

### **Objective:**

The aim of this 'Workshop on Robot Operation & Applications' is to provide technical insight to Engineering Students about the Operation & Programming of Industrial Robots. During the workshop participants visit the various State of Art facilities available at Center and also witness operation of various Robotic Applications including Material Handling, Advanced Welding, Machining / Milling and 3D Printing.

**Course Duration:** 05 Days (40 Hours)

**Course Fee:** Rs. TBC

### **Course Content:**

1. Basics of Industrial Robot
2. Need of Robotics
3. Robot Classification/Architecture /Configuration
4. Operation of the Industrial Robot System
5. Major Benefits and Applications: Arc & Spot Welding; Milling, Handling
6. Future Trends in Robotics
7. Current National & International status of Industrial Robots
8. Career Options in Robotics

### **Course Outcome:**

- ✓ Understand the Basic principles of Industrial Robot and its functions
- ✓ Understand Importance of robotics in today and future goods production
- ✓ Demonstrate Robot Safety/Awareness of various components of Industrial Robot



**Course Name: Industry Automation****Course Code:** COE/RA/IA001**Objective:**

This aims to give various features and functionalities of Servo drives and its Motors, Inverter with advance PLC (iQ-R) system. its provides fundamental knowledge on PLC, HMI, SERVO & VFD and how its integrated for factory automation.

**Course Duration:** 05 Days (40 Hours)**Course Fee:** Rs.TBC**Course Content:**

1. Basics of Industrial Automation
2. Need and Role of Automation
3. Classification / Architecture / Configuration of Industrial Automation
4. Operational overview of the Input, Output and Control Technologies
5. Programmable Logic Controller (PLC) Overview
6. PLC Hardware and Components
7. SERVO Motors Hardware and Components
8. VFDHardware and Components
9. Future Trends in Automation Sector
10. Career Options and Job roles available in Automation

**Course Outcome:**

- ✓ Understand the basic architecture of automation and functional overview of various devices.
- ✓ Understand the importance of automation in today's industrial environment
- ✓ Gain Improved ability to conceptualize and understand automation solutions particularly related to machinery and control systems.



