Proposed Short Term Course Outline for Automation and Robotics - Applicable to all Branch

Duration: 30 hrs

Objective of the Course:

Hands on experience with latest trends and technologies in industry for Automation and Robotics. To understand necessity of Automation, Robotics and Internet of Things for present and future manufacturing industries. Equip student with multi-disciplinary skillset in fast evolving technological world with all cutting-edge industry grade software and hardware which are integral part of Industry 4.0

Course Outcome:

On completion of the course, the learner will be able to

- Possess Comprehensive PLM Knowledge
- Master Industrial Automation Fundamentals
- Advance PLC Programming Skills
- Excel in Industrial Robotics
- Comprehend Industry 4.0 Principles
- Navigate Smart Manufacturing Systems
- Prepare for Future Manufacturing

Day 1 -

Unit 1: Product Life Cycle Management (PLM)

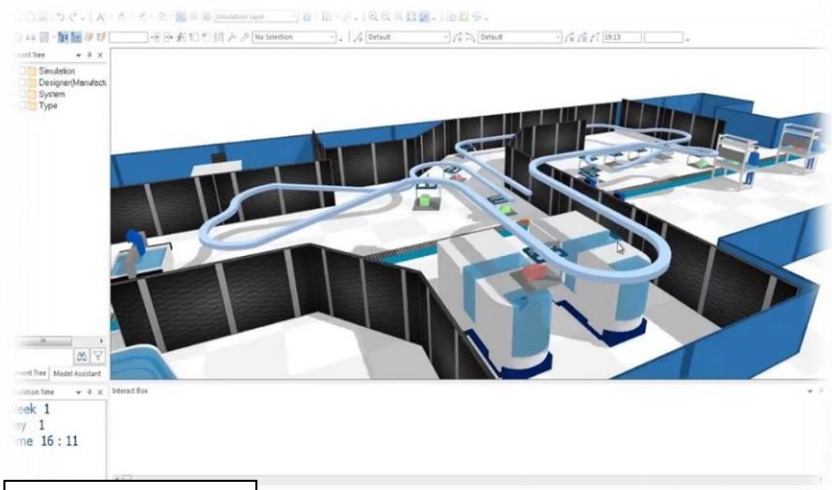
PLM comprises the initiation, design, production, utilization, and decommissioning of a product, providing an application of CAD, CAM, CNC and 3D Printer Manufacturing and Digital Factories in PLM.

Preparation of part on actual CNC Machine.

- CAD CAM -1 Hours
- CNC – 1 Hours
- 3D Printer – 1 Hours
- Digital Factory (Discrete Event Simulation) – 1 Hours

Advance Machining (CNC/VMC)

3D Printing



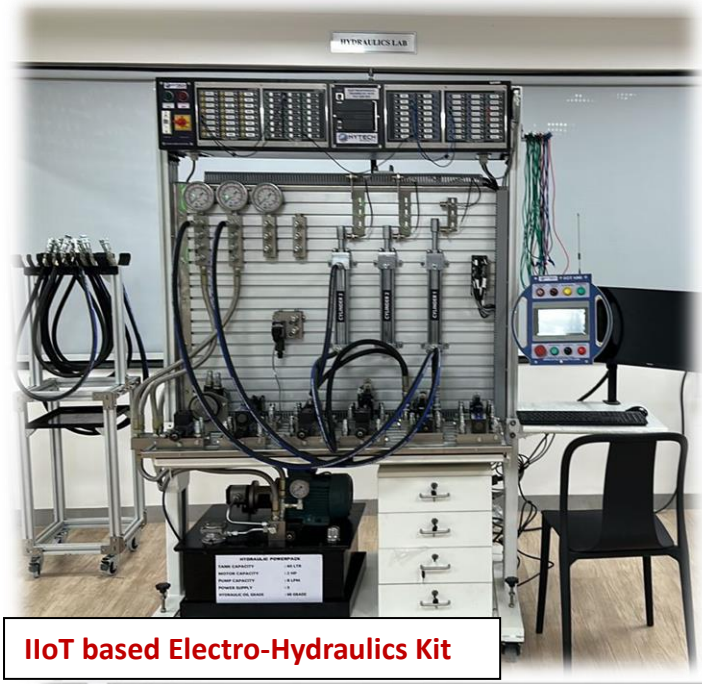
Digital Factory

Unit 2: Automation

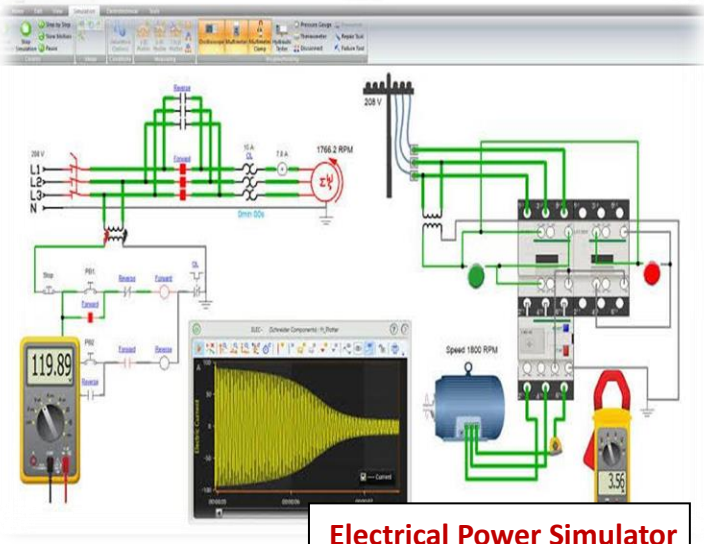
Introduction to industrial automation with hydraulics, pneumatics, electricals and proportional control.

Understanding Automation principal and building actual circuit of industrial application of Automation on simulation software named Automation Studio.

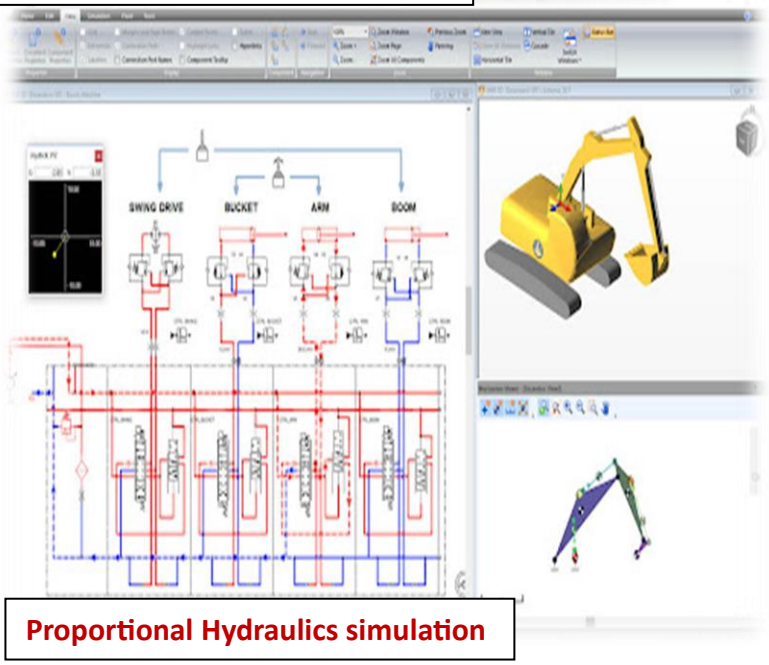
- Electro-Hydraulics- 1 Hours
- Electro-Pneumatics – 1 Hours
- Electricals – 1 Hours
- Proportional Hydraulics & Pneumatics – 1 Hours



IIoT based Electro-Hydraulics Kit



Electrical Power Simulator



Proportional Hydraulics simulation

IIoT based Electro-Pneumatics Kit

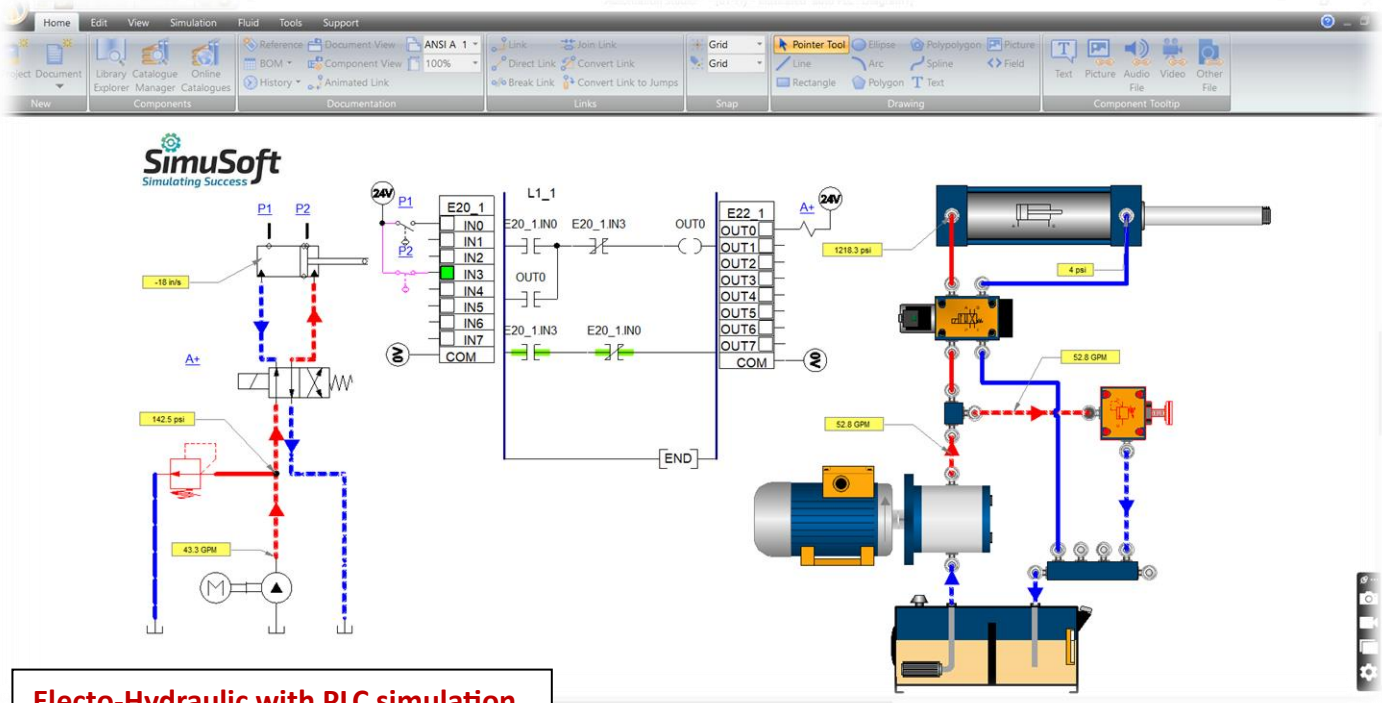
Day 2 -

Unit 3: PLC Automation

Introduction to advance industrial automation using PLC, HMI and SCADA.
Building PLC ladder logic for real life application in automation on simulation software.
Hands on experience on working with ladder logic for Siemens S7 1200 PLC and HMI.

- PLC Basic and Programming on Simulation Software – 4 Hours
- HMI introduction and application – 1 Hours
- SCADA Introduction – 1 Hours

Advanced PLC



Electo-Hydraulic with PLC simulation

Day 3 -

Unit 4: Industrial Robotics

Introduction to Industrial Robots and various application of robots in Industry.

Working with robot simulation software for robot programming for different robots like Fanuc, Kuka, Mitsubishi etc.

Hands on experience with real Mitsubishi Robotic cell for pick & place operation and some other applications.

- Introduction to Industrial Robots - 2 Hours
- Application of Robots in Industry - 1 Hours
- Robot Programming in RoboDK Software - 4 Hours
- Hands on practical on Fanuc Robot - 1 Hours

IIoT based Robotic Cell

4 Axis SCARA Robot Cell

Day 4 -

Unit 5: Industry 4.0

Exploring the core principles and technologies of Industry 4.0, focusing on the integration of automation, robotics, data analytics, and the Internet of Things (IoT) in modern manufacturing.
Concept of digital twins and simulation tools in the context of Industry 4.0

- Introduction to Industry 4.0 - 1 Hours
- Contents and application of Industry 4.0 - 1 Hours
- Exploring Sensors, Cloud and communication platform for Industry 4.0 - 1 Hours

Unit 6: Smart Factory/ Future Factory

Introduction of intelligent manufacturing system and understand the role of cyber-physical systems in Industry 4.0, emphasizing connectivity and interoperability, and learn how these elements enable seamless communication and collaboration among machines, processes, and humans. Everything will be covered on modular smart factory setup which is industrial grade setup.

- Necessity of Smart Factory – 1 Hours
- Advantages over traditional factories – 1 Hours
- Components of Smart Factory and its application– 1 Hours

Smart Factory Set up

Assessment test on all unit – 1 Hours

Career counselling and interview preparation techniques – 1 Hour

Simulation Lab