Advanced IIoT and Connectivity for Industry 4.0

COURSE OUTLINE

Catalogue Number	77-3301-0016
Category	Industry 4.0
Duration	15 Hours
Prerequisite Courses	All Level 1 Industry 4.0 Courses

Activity 1A: Smart Sensors - Part 1

- Standard or Smart Sensors?
- Smart Sensor Functionality
- Smart Sensor Architecture
- Industrial Applications
- Manufacturing Applications

Activity 1B: Smart Sensors - Part 2

- Temperature and Humidity Sensors
- Proximity Sensors
- Level Sensors
- Chemical Sensors
- Motion Sensors
- Accelerometers

Activity 2: PLC Functions and Applications

- PLC Structure and Function
- PLC System Configuration
- PLC Programming Types and Languages
- Industrial PLC Applications

Activity 3: Machine to Machine (M2M) Communication

- Defining M2M
- M2M Communication Flow
- M2M vs IoT
- M2M Architecture
- M2M Applications

Activity 4A: Cloud Connectivity – Part 1

- IoT Data Analytics
- Data Analytics on the Cloud
- Edge Analytics
- IoT Analytics Use Cases

Activity 4B: Cloud Connectivity – Part 2

- Cloud Communication Architecture
- Edge IoT Architecture
- Connecting Devices to the Cloud
- Connection Options
- IoT Connectivity Model

Activity 5A: SCADA Systems – Part 1

- The Evolution of SCADA Systems
- SCADA Components and Hardware
- Main Functions
- Communication Infrastructure
- SCADA vs DCS

Activity 5A: SCADA Systems – Part 2

- Advantages and Disadvantages of SCADA Systems
- Installing and Deploying a SCADA System
- Phases of SCADA Deployment
- Applications of SCADA Systems

Activity 6: Implementing IoT

- IoT in Industry
- The Purpose of IoT Architecture
- 3-Layer IoT Architecture
- 7-Layer IoT Architecture
- IoT in Manufacturing: Use Cases

Activity 7: Design Modularity in Smart Factories

- Defining Modular Design
- Everyday Modular Design Applications
- Advantages of Modular Design

- Modular Design in Automation
- Orchestration and Integration
- Modular IoT Architecture

Activity 8: Industrial IoT Reference Architecture (IIRA)

- What is IIRA?
- Reference Architecture and Its Importance
- The IIRA Viewpoints
- The Functional Domains
- Example Architecture Patterns

Activity 9A: IoT Protocols and Standards – Part 1

- Key Protocol Components
- The OSI and TCP/IP Models
- MQTT
- OPC

Activity 9B: IoT Protocols and Standards – Part 2

- IIoT Data Protocols
- IIoT Network Protocols
- Governing Bodies and Standards for IIoT
- IIoT System Interoperability

Activity 10A: Material Identification – Part 1

- Asset Tracking and Tagging
- Using IoT for Asset Tracking
- Components for Smart Asset Tracking
- RFID Tag Types
- RFID System Architecture

Activity 10B: Material Identification – Part 2

- Barcodes
- QR Codes
- NFC
- GPS
- Bluetooth LE

Activity 11: Driving Manufacturing with IIoT

- Expanding IIoT
- The IIoT Ecosystem
- IIoT for Business Growth
- IIoT Value Drivers for Businesses
- Applications and Use Cases