

## Industrial Networks Education

# Fundamentals of Industrial Networking

### General Information

Course Code: IEN-NETFUND1A  
Length: 1.5 Days

### Audience

This course is for anyone interested in learning about the fundamentals of networking, either as an introduction or as a refresher, regardless of the industry, as the content is about the technology. Participants range from Sales Engineers wanting to get a better understanding of the topic to Plant Engineers or Substation Engineers wanting to freshen up before taking one of our certification courses. Other ideal candidates could include, but is not limited to the following:

- Application Engineers
- Automation Engineers
- Commission Engineers
- Communication Engineers
- Control Engineers
- Facility Managers
- Operations or IT Network Engineers
- Plant Engineers
- Project Engineers
- Sales Engineers
- Substation Engineers
- System Engineers

### Prerequisites

- None

### Profile

This course is an introductory course to networking technology and mechanisms – the foundation of today's digital communication. Designed as a recommended prerequisite for our suite of Certification courses, it will take you on a tour through the seven networking layers.

At the end of the course, students will have a broad understanding of networking terminology, as well as a deeper knowledge of the principles of building Ethernet networks.

### Objectives

*Upon completion of this course, the student will learn:*

- Understanding the OSI Reference Model
- Learning the Physical Layer (Copper, Fiber, Wireless)
- Learning the Data Link Layer (MAC, VLAN)
- Learning the Network Layer (TCP/IP, Routing Protocols)
- IPv4 vs IPv6 Addressing
- Understanding Upper Layer Communications

### Topics

1. Introduction to Industrial Ethernet
  - a. Network Basics
  - b. Communication in the office
  - c. Ethernet evolution
  - d. Industrial Ethernet
  - e. Industrial Networks – Applications
  - f. Ethernet on the OSI reference model
  - g. OSI-based Network Conversation
  - h. TCP/IP Model
2. Layer 1 – Physical Layer
3. Layer 2 – Data Link Layer
4. Layer 3 – Network Layer
5. Layer 4 thorough 7 – Upper Layers