# Introduction to Networking and Cybersecurity for Industry 4.0

## *COURSE OUTLINE*

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| **Catalogue Number** | 77-3301-0012 |
| **Category** | Industry 4.0 |
| **Duration** | 15 Hours |
| **Prerequisite Courses** | Introduction to Industry 4.0 |

**Activity 1: IP Networking Basics - Part 1**

- Introduction to Computer Networks
- How the Internet Works
- Types of Connections
- Basic Internet Equipment
- Routers and Modems

**Activity 2: IP Networking Basics - Part 2**

- Connecting to the Internet
- Connecting Using Wi-Fi
- Connecting Using Ethernet
- IP and Mac Addresses – Structure and Function

**Activity 3: Communication Protocols**

- Protocols and Standards – Definition and Function
- Key Elements of Protocols
- Common Protocols
- Characteristics of IoT Connections

**Activity 4: Cloud Computing**

- Defining Cloud Computing
- Benefits of Cloud Computing
- Cloud Computing Architecture
- Cloud Computing and Security

**Activity 5: Components of the Manufacturing Network**

- The Smart Factory
- Decision Making in Smart Factories
- Cyber=physical Systems (CPS) – Definition and Examples
- CPS Architecture

**Activity 6: Securing Digital Manufacturing Operations**

- Smart Factory Cybersecurity Risks
- Operational Technology (OT) Platforms
- Security Vulnerabilities of OT Platforms
- Risk Mitigation Strategies for OT Cybersecurity

**Activity 7: Cyber Threats**

- Defining Cyber Threats
- The Evolution of Cyber Threats
- Types of Cyber Threats
- Cyber Attack Case Studies

**Activity 8: Basic Cybersecurity Practices**

- Risk Factors
- Important Practices
- Cybersecurity Practices for Smart Factories
- Protocols and Standards for Cybersecurity

**Activity 9: Essential Cyber System Technologies**

- Defining Cyberspace and Cyber Systems
- Cyber-physical Systems
- Machine-to-Machine Communication
- Edge, Fog, and Cloud Computing

**Activity 10: Malware**

- Defining Malware
- Common Types of Malware
- Virus Attack Case Studies

**Activity 11: Malware Protection**

- Basic Protection Strategies
- Installing Anti-Virus Software

- Updating Your Computer
- Checking a Computer for Viruses
- Backing up a Computer

**Activity 12: Identifying Cyber Attacks**

- Signs of Hacking
- How to Spot Malware
- Types of Hacking
- Blackmail

**Activity 13: Cyber Breach Response**

- Advanced Persistent Threats (APTs)
- Cyber Attack Damage Levels
- Phases of Cyber Attacks
- Preparing for Cyber Attacks
- Responding to Cyber Attacks

**Activity 14: IIoT Cybersecurity Basics**

- The Differences between IT and IIoT Cybersecurity
- Risks Involved in IIoT Cyber Attacks
- The PERA Model
- The CCE-Based Approach

**Activity 15: Cloud Cybersecurity Basics**

- Major Cloud Security Threats
- Ways to Improve Cloud Security
- Ethical Hacking

**Activity 16: Cybersecurity Resources**

- The Role of the Government in Cybersecurity
- Bodies Overseeing Nationwide Cybersecurity