



# Industrial Network Specialisation - Underground Mining

This hands-on course covers network design, installation, and troubleshooting. It includes the Vernetzen Certified Industrial Network Specialist – Underground Mining certification.



Empowering professionals with cutting-edge skills and real-world operational technology experience.

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## Overview:

The Industrial Network Specialist Course provides a thorough understanding and expertise in operational technology, preparing individuals for careers focused on OT. Through a blend of lectures and practical labs, participants will gain skills in installing, operating, configuring, and validating advanced IPv4 and OT networks. The curriculum encompasses in-depth configuration of network elements like switches, WoCs, Wireless APs, and Veto PNA and Endpoint devices, along with network device management and identification of basic security risks. Additionally, the course emphasizes extensive planning and designing of OT networks, incorporating industry best practices.

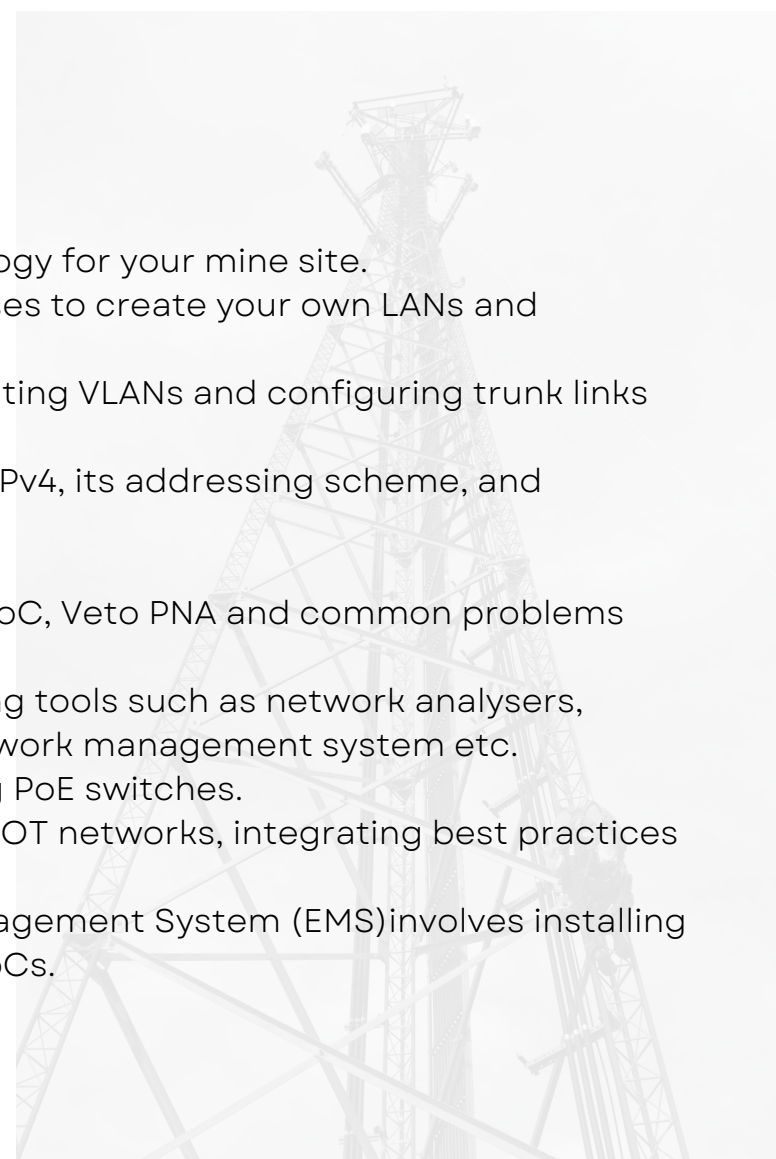
## Target Audience:

A Technician, Planner, Operational Team member, and Cyber Security Specialist with expertise in the fundamental of Industrial networks.

## Objectives:

After completing this course, you should:

- Have acquired expertise in selecting the optimal network topology for your mine site.
- Gain sufficient hands-on experience through laboratory exercises to create your own LANs and understand the role of switches within LAN environments.
- Gain practical expertise in installing manageable switches, creating VLANs and configuring trunk links between switches through hands-on exercises.
- Have an in-depth understanding of the TCP/IP network model, IPv4, its addressing scheme, and subnetting.
- Install and configuring a WoCs
- Identify and troubleshoot common switched network issues, WoC, Veto PNA and common problems associated with IPv4 addressing.
- Have an understanding of the functionality of various networking tools such as network analysers, network monitoring software, remote access tool, Wireless network management system etc.
- Determine the Effective PoE power budget to avoid overloading PoE switches.
- Have an understanding of the thorough planning and design of OT networks, integrating best practices from the industry.
- Have an understanding of the configuration of an Element Management System (EMS) involves installing the software, discovering and adding network elements like WoCs.





## Course Outline:

### Day 1:

#### Module 1: Optimal Network Topology Selection

- Acquiring expertise in selecting optimal network topology for mine sites
- Overview of different network topologies and their suitability for mining operations

#### Module 2: LAN Creation and Switch Roles

- Hands-on exercises to create LANs
- Understanding the role of switches within LAN environments through practical exercises

#### Module 3: Switch Installation and VLAN Configuration

- Practical expertise in installing manageable switches
- Creating VLANs and configuring trunk links between switches through hands-on exercises

#### Module 4: TCP/IP Network model and IPv4 Addressing

- In-depth understanding of TCP/IP Internet Layer
- Overview of IPv4 addressing scheme and subnetting concepts

#### Module 5: Wireless Controller Configuration

- Hands-on lab focusing on configuring a Wireless over Coax (WoC)
- Understanding WoC features and capabilities through practical exercises.

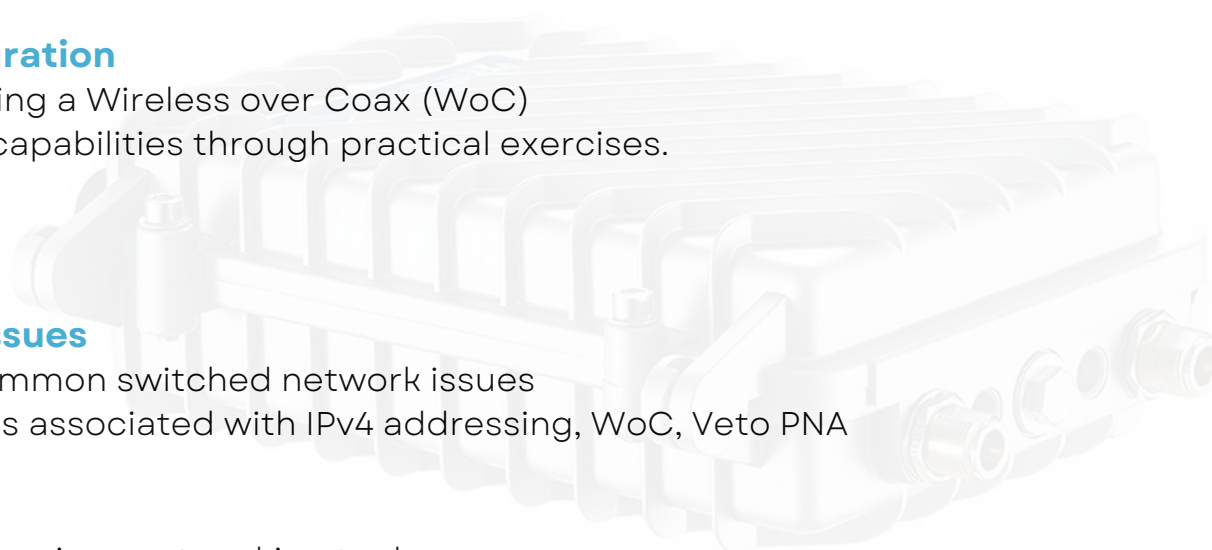
### Day 2:

#### Module 6: Troubleshooting Network Issues

- Identifying and troubleshooting common switched network issues
- Troubleshooting common problems associated with IPv4 addressing, WoC, Veto PNA

#### Module 7: Networking Tools

- Understanding the functionality of various networking tools
- Hands-on lab exercises with network analyzers, monitoring software, remote access tools, Wireless Network Management System (WNMS), etc.







## Course Outline:

### Module 8: Power over Ethernet (PoE) Budgeting

- Lab exercise on determining Effective PoE power budget.
- Avoiding overloading PoE switches through practical exercises

### Module 9: Planning and Design of OT Networks

- Comprehension focuses on thorough planning and design of OT networks.
- Integrating industry best practices into OT network planning and design

### Module 10: Configuration of an Element Management System (EMS)

- Install EMS and configure network element discovery (e.g., WoCs) to enable monitoring and management.

## Assessment and Practical Sessions:

Quizzes and assessments at the end of each module to evaluate understanding.

Hands-on practical sessions for LAN creation, switch configuration, troubleshooting, and network tool usage

## Resources:

- Online resources covering advanced networking concepts.
- Hands-on labs with networking equipment for practical exercises
- Instructor-led demonstrations and presentations

This course provides comprehensive training on advanced networking solutions tailored specifically for mining operations. Participants will gain practical expertise in network topology selection, LAN creation, switch configuration, troubleshooting, and network tool usage over the course of two days.





## **Course Outline:**

## **Certification:**

Upon completion of the course, you can take the Vernetzen Certified Exam.

## **Prerequisites:**

Attendees should meet the following prerequisites:

- Basic computer literacy
- Basic PC operating system navigation skills
- Basic internet usage skills
- Basic IP address knowledge
- Must have knowledge of Industrial Networking Fundamental course.

## **Price:**

- \$4,500 + GST = \$4,950 total

## **Dates Available:**

- October 21-25, 28-November 1; November 4-8, 11-15, 18-22, 25-29; December 2-6, 9-13

