

## Industrial Networks Education

# Advanced Switching & Routing in Industrial Networks with RUGGEDCOM

### General Information

Course Code: IEN-ADVRCMSWR  
Length: 4.5 Days

### Audience

This course is for users who are involved with developing or sustaining networks in rugged environments – such as Electric Power, Transportation, Rail, and Defense markets, where RUGGEDCOM equipment is required. This includes, but is not limited to the following:

- Application Engineers
- Automation Engineers
- Communication Engineers
- Control Engineers
- Operations or IT Network Engineers
- Project Engineers
- Substation Engineers
- System Engineers

### Prerequisites

- Completion of, or knowledge in accordance with, “Switching and Routing in Industrial Networks with RUGGEDCOM” course.
- Theoretical and practical knowledge associated with planning, implementing, operating, and maintaining industrial Layer 2 and Layer 3 networks.

### Profile

This course prepares for the certification “Siemens Certified Expert for Industrial Networks – Switching & Routing”. A voluntary certification examination which consists of two sections will take place at the end of the training.

Throughout the course, students will have ample time for practical exercises, diagnostics, and troubleshooting. The course uses a hands-on model for realistic demonstrations.

At the end of the course, students are equipped with the knowledge to plan, implement and provide support for Layer 3 networks in an industrial or industry-specific environment.

### Objectives

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

- Theoretical and practical knowledge for real-world implementation of high-availability Industrial Layer 2 networks and the applicable methods to operate and maintain these networks.
- Seamless redundancy mechanisms, time synchronization methods and technologies.
- Theoretical and practical knowledge of routing protocols and concepts which help facilitate communication inside and between multiple network locations using Layer 3 network, as well as service provider backbones.
- Redundant network architectures based on the IEC 62439-3 (PRP/HSR) standard.

### Topics

1. Parallel Redundancy Protocol (PRP)
2. High-Availability Seamless Redundancy Protocol (HSR)
3. Coupling Redundancy Protocols using RNA
4. Time Synchronization
5. Advanced Routing Techniques using OSPF
6. Tunneling
7. Multi-case Filtering and Routing
8. Border Gateway Protocol (BGP)