SCADA Systems for Process Industries Training Course

Professional Development Training Course Outline

Category	General Training	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Supervisory Control and Data Acquisition (SCADA systems) have become the backbone of modern process industries automation, enabling real-time monitoring, control, and optimization of critical industrial operations. In sectors such as oil & gas, power generation, water treatment, pharmaceuticals, and manufacturing, SCADA integrates industrial IoT (IIoT), PLCs, RTUs, and HMI systems to deliver seamless data acquisition and process visualization. With the rise of Industry 4.0, smart factories, and digital transformation, SCADA has evolved from traditional control systems into highly connected, cloud-enabled platforms that improve operational efficiency, predictive maintenance, and cybersecurity resilience.

SCADA Systems for Process Industries Training Course is designed to provide a comprehensive understanding of SCADA architecture, communication protocols, system integration, and real-world industrial applications. Participants will gain hands-on expertise in real-time data acquisition, alarm management, distributed control systems (DCS), OPC standards, and industrial cybersecurity frameworks. The course also emphasizes modern trends such as edge computing, AI-driven analytics, digital twins, and cloud SCADA solutions, ensuring learners are equipped with the latest skills required in today's rapidly evolving industrial automation landscape.

Programme Curriculum

SCADA Systems for Process Industries Training Course

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Course Duration

5 days

Course Objectives

1. Master fundamentals of SCADA architecture and industrial automation systems
2. Understand real-time data acquisition and process control systems
3. Configure and program PLC, RTU, and HMI integration in SCADA networks
4. Apply OPC UA, Modbus, and industrial communication protocols
5. Develop skills in alarm management and event monitoring systems
6. Implement industrial cybersecurity for SCADA networks (ICS security)
7. Design Human Machine Interface (HMI) dashboards for process industries
8. Analyze data visualization and SCADA reporting tools
9. Explore cloud-based SCADA and remote monitoring systems
10. Integrate IIoT (Industrial Internet of Things) with SCADA systems
11. Apply predictive maintenance using SCADA data analytics
12. Understand DCS vs SCADA system architecture and applications
13. Implement Industry 4.0 smart factory automation solutions

Target Audience

1. Automation and Control Engineers
2. Electrical and Instrumentation Engineers
3. Process Plant Operators and Supervisors
4. Industrial Maintenance Technicians
5. Oil & Gas Industry Professionals
6. Power Plant Engineers and Technicians
7. Manufacturing and Production Managers
8. Engineering Students in Automation, Mechatronics, and Electrical fields

Course Modules

Module 1: SCADA Fundamentals & System Architecture

- Overview of SCADA systems in process industries
- Architecture-Master Terminal Unit (MTU), RTU, PLC
- SCADA vs DCS comparison
- SCADA hardware and software components
- Real-time monitoring principles

- **Case Study:** Water treatment plant SCADA implementation for real-time flow control

Module 2: Industrial Communication Protocols

- Modbus TCP/RTU fundamentals
- OPC UA architecture and interoperability
- Profibus and Ethernet/IP networks
- Data acquisition methods
- Protocol troubleshooting techniques
- **Case Study:** Oil refinery communication network optimization using OPC UA

Module 3: PLC, RTU & Field Devices Integration

- PLC programming basics for SCADA
- RTU configuration and remote operations
- Sensor and actuator interfacing
- Signal conditioning and data conversion
- Industrial wiring standards
- **Case Study:** Gas pipeline remote monitoring using RTU-based SCADA system

Module 4: HMI Design & Visualization Systems

- HMI design principles and usability
- SCADA dashboard development
- Alarm visualization and event handling
- Real-time graphical process representation
- User interface optimization
- **Case Study:** Power plant HMI redesign improving operator response time

Module 5: Alarm Management & Event Processing

- Alarm prioritization techniques
- Event logging and historical data analysis
- Fault detection and diagnostics
- Reducing alarm fatigue strategies
- Notification systems and alerts
- **Case Study:** Chemical plant alarm flood reduction using advanced filtering

Module 6: Industrial Cybersecurity for SCADA

- SCADA security architecture
- Firewall and intrusion detection systems
- Risk assessment in ICS environments
- Cyberattack prevention strategies
- Compliance with ISA/IEC 62443 standards
- **Case Study:** Cybersecurity breach prevention in smart manufacturing plant

Module 7: SCADA in IIoT, Cloud & Industry 4.0

- Integration of IIoT with SCADA
- Cloud-based SCADA platforms
- Edge computing applications

- Digital twin modeling
- Predictive analytics in process industries
- **Case Study:** Smart factory using cloud SCADA for predictive maintenance

Module 8: Advanced SCADA Applications & Optimization

- Energy management systems
- Process optimization techniques
- Big data analytics in SCADA
- Machine learning integration
- System scalability and redundancy
- **Case Study:** Oil & gas upstream optimization using AI-driven SCADA analytics

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

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