Process Automation Using Siemens PLCs 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

The Process Automation Using Siemens PLCs Training Course is program designed to equip learners with advanced skills in industrial automation, PLC programming, SCADA integration, and smart manufacturing systems. In today's rapidly evolving Industry 4.0 and IIoT-driven environment, Siemens PLCs play a critical role in optimizing production efficiency, reducing downtime, and enabling real-time decision-making in automated plants. This training provides hands-on exposure to Siemens SIMATIC S7 series, TIA Portal, HMI configuration, industrial networking, and process control systems, making it ideal for engineers and technicians aiming to excel in automation careers.

This course bridges the gap between theoretical knowledge and real-world industrial applications by focusing on PLC ladder logic programming, process instrumentation, PID control, fault diagnostics, and system integration. Learners will gain practical expertise in designing, programming, and troubleshooting automated systems used in industries such as manufacturing, oil & gas, pharmaceuticals, food processing, energy, and water treatment plants. With a strong emphasis on hands-on labs, real-time simulations, and industry case studies, this program ensures participants are fully prepared to meet modern automation challenges and advance their careers in industrial control systems and smart factory technologies.

Programme Curriculum

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Course Duration

5 days

Course Objectives

1. Master Siemens PLC programming using TIA Portal
2. Develop expertise in ladder logic, FBD, and STL programming
3. Understand industrial automation systems architecture
4. Implement HMI design and SCADA integration
5. Configure Siemens S7-1200 and S7-1500 PLCs
6. Apply PID control for process optimization
7. Troubleshoot PLC hardware and software faults
8. Design industrial communication networks
9. Implement real-time process monitoring systems
10. Integrate IIoT and smart manufacturing solutions
11. Enhance industrial cybersecurity awareness in automation
12. Perform system commissioning and validation
13. Optimize energy-efficient automated production systems

Target Audience

1. Electrical and Electronics Engineers
2. Instrumentation and Control Engineers
3. Automation Technicians and Technologists
4. Mechanical Engineers in manufacturing industries
5. Industrial Maintenance Engineers
6. Fresh graduates in engineering and technology fields
7. SCADA and PLC system integrators
8. Professionals transitioning into Industry 4.0 automation careers

Course Modules

Module 1: Fundamentals of Industrial Automation

- Introduction to automation systems and PLCs
- Role of Siemens in industrial automation
- Basics of sensors and actuators
- Automation pyramid

- Safety standards in automation systems
- **Case Study:** Automated conveyor system in a packaging plant

Module 2: Siemens PLC Hardware Architecture

- Overview of S7-1200 and S7-1500 PLCs
- CPU, memory, and I/O modules
- Wiring and hardware setup
- Power supply and system configuration
- PLC rack expansion techniques
- **Case Study:** Bottling plant PLC hardware setup design

Module 3: PLC Programming with TIA Portal

- Introduction to TIA Portal environment
- Ladder Logic programming fundamentals
- Function blocks
- Timers, counters, and memory handling
- Program debugging and simulation
- **Case Study:** Traffic light control system automation

Module 4: HMI and SCADA Integration

- Designing operator interfaces
- WinCC configuration basics
- Real-time data visualization
- Alarm and event management
- Remote monitoring systems
- **Case Study:** Water treatment plant monitoring dashboard

Module 5: Industrial Networking & Communication

- PROFINET and PROFIBUS protocols
- Ethernet-based industrial communication
- Device addressing and configuration
- Data exchange between PLCs
- Network troubleshooting techniques
- **Case Study:** Multi-machine synchronization in a factory line

Module 6: Process Control & PID Systems

- Fundamentals of process control loops
- PID tuning methods
- Temperature, pressure, and flow control
- Analog signal processing
- Stability and response optimization
- **Case Study:** Temperature control in chemical reactor system

Module 7: Fault Diagnosis & Troubleshooting

- PLC diagnostics tools in TIA Portal
- Common hardware failures

- Software error handling
- Signal tracing and debugging
- Preventive maintenance strategies
- **Case Study:** Downtime reduction in an automotive assembly line

Module 8: Advanced Automation & Industry 4.0

- Introduction to IIoT in Siemens systems
- Cloud-based automation monitoring
- Data analytics in production systems
- Smart sensors and predictive maintenance
- Cybersecurity in industrial systems
- **Case Study:** Smart factory implementation in food processing industry

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

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com