Industrial Process Automation in Chemical Engineering 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

Industrial Process Automation in Chemical Engineering is a transformative training program designed to equip engineers, technicians, and industry professionals with cutting-edge skills in smart manufacturing, process control systems, PLC/DCS integration, and industrial digitization. As chemical industries evolve toward Industry 4.0, IoT-enabled plants, and AI-driven process optimization, automation has become the backbone of efficiency, safety, and productivity. Industrial Process Automation in Chemical Engineering Training Course provides a strong foundation in both theoretical and practical aspects of automated chemical process systems used in modern industries such as petrochemicals, pharmaceuticals, fertilizers, polymers, and refining.

With a strong focus on real-time process monitoring, SCADA systems, instrumentation, and control engineering, learners will gain hands-on expertise in designing, operating, and optimizing automated chemical plants. The program integrates advanced tools like PLC programming, MATLAB simulation, HMI design, and digital twin technology, enabling participants to solve real industrial challenges. By the end of the training, learners will be capable of implementing smart automation solutions that improve process efficiency, safety compliance, predictive maintenance, and operational excellence.

Programme Curriculum

Industrial Process Automation in Chemical Engineering Training Course

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Course Duration

5 days

Course Objectives

1. Understand fundamentals of Industrial Automation in Chemical Engineering
2. Master PLC (Programmable Logic Controller) programming and ladder logic
3. Implement DCS (Distributed Control Systems) in chemical plants
4. Develop expertise in SCADA systems and real-time monitoring
5. Apply Industry 4.0 concepts in chemical process industries
6. Design and analyze process control systems and feedback loops
7. Use smart sensors and industrial IoT (IIoT) integration
8. Perform process simulation using MATLAB and Aspen HYSYS
9. Implement HMI (Human Machine Interface) design and optimization
10. Understand industrial robotics and automation integration
11. Enhance predictive maintenance using AI and machine learning
12. Ensure process safety, hazard analysis, and compliance systems
13. Optimize energy efficiency and sustainable chemical production systems

Target Audience

1. Chemical Engineering Students
2. Process Engineers in Manufacturing Industries
3. Instrumentation & Control Engineers
4. Plant Operators in Chemical & Petrochemical Plants
5. Automation Engineers & Technicians
6. Quality Control & Process Optimization Specialists
7. Maintenance Engineers in Industrial Facilities
8. Professionals transitioning into **Industry 4.0 automation roles**

Course Modules

Module 1: Fundamentals of Industrial Automation

- Introduction to automation in chemical industries
- Evolution from manual to smart plants
- Automation hierarchy
- Overview of PLC, DCS, SCADA systems
- **Case Study:** Automation upgrade in a fertilizer production plant improving yield by 18%

Module 2: PLC Programming & Applications

- PLC architecture and working principles
- Ladder logic programming basics
- Timers, counters, and sequencing operations
- PLC interfacing with chemical processes
- **Case Study:** Automated reactor temperature control using PLC in a polymer plant

Module 3: SCADA Systems & Industrial Monitoring

- SCADA architecture and components
- Real-time data acquisition systems
- Alarm management and event logging
- Remote plant monitoring techniques
- **Case Study:** SCADA implementation in a water treatment chemical facility

Module 4: Distributed Control Systems (DCS)

- DCS architecture and configuration
- Process loop control strategies
- Redundancy and system reliability
- Integration with field instruments
- **Case Study:** DCS deployment in a crude oil refining unit for stability improvement

Module 5: Industrial IoT & Smart Sensors

- IIoT architecture in chemical plants
- Smart sensor networks and data flow
- Cloud integration for process data
- Cybersecurity in industrial systems
- **Case Study:** IoT-based leak detection system in chemical storage tanks

Module 6: Process Control & Simulation

- Feedback and feedforward control systems
- PID tuning techniques
- MATLAB & Aspen HYSYS simulation
- Dynamic process modeling
- **Case Study:** Simulation-based optimization of distillation column efficiency

Module 7: HMI Design & Operator Interface

- HMI design principles
- User interface optimization
- Alarm visualization systems
- Real-time process interaction
- **Case Study:** HMI redesign reducing operator response time in a pharmaceutical plant

Module 8: AI, Predictive Maintenance & Smart Industry

- Machine learning in process automation
- Predictive maintenance strategies

- Failure prediction models
- Energy optimization techniques
- **Case Study:** AI-based pump failure prediction in a petrochemical plant

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

Start Date	End Date	Location	Price
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