Absorption and Stripping Operations 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

Absorption and stripping operations are critical mass transfer processes widely utilized in the oil and gas, petrochemical, chemical manufacturing, environmental engineering, carbon capture, hydrogen processing, refinery operations, and sustainable industrial processing sectors. As industries increasingly focus on process optimization, energy efficiency, emissions reduction, ESG compliance, and operational excellence, professionals must possess advanced knowledge of gas-liquid contacting systems, packed columns, tray towers, solvent selection, process simulation, and troubleshooting methodologies. Absorption and Stripping Operations Training Course equips participants with practical and theoretical expertise to optimize absorption and stripping systems for enhanced productivity, safety, and sustainability.

The course integrates modern industry practices, digital transformation concepts, process intensification strategies, AI-driven process optimization, predictive maintenance techniques, carbon management initiatives, and real-world operational case studies. Participants will develop competencies in design principles, performance evaluation, operational troubleshooting, process simulation, equipment reliability, energy management, and environmental compliance. Through interactive discussions and industrial case studies, learners gain practical insights into maximizing process efficiency while minimizing operational risks and environmental impact.

Programme Curriculum

Absorption and Stripping Operations Training Course

Introduction

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Course Duration

5 days

Course Objectives

By the end of this training program, participants will be able to:

1. Understand advanced gas absorption and stripping fundamentals.
2. Apply mass transfer optimization techniques in industrial operations.
3. Evaluate packed column and tray tower performance.
4. Improve process efficiency through digital process monitoring.
5. Analyze gas-liquid equilibrium and thermodynamic behavior.
6. Optimize solvent selection for sustainable operations.
7. Implement energy-efficient process intensification strategies.
8. Utilize process simulation software for operational excellence.
9. Conduct root cause analysis for operational troubleshooting.
10. Enhance asset reliability and predictive maintenance practices.
11. Improve environmental compliance and emissions management.
12. Support carbon capture, utilization, and storage (CCUS) initiatives.
13. Develop data-driven decision-making capabilities for process optimization.

Target Audience

1. Process Engineers
2. Chemical Engineers
3. Production Engineers
4. Plant Operations Supervisors
5. Refinery and Petrochemical Professionals
6. Environmental Engineers
7. Maintenance and Reliability Engineers
8. Technical Managers and Plant Leaders

Course Modules

Module 1: Fundamentals of Absorption and Stripping Operations

- Principles of mass transfer operations

- Gas-liquid equilibrium concepts
- Absorption and stripping mechanisms
- Industrial applications and process selection
- Performance indicators and operational benchmarks
- **Case Study:** Optimization of an amine gas sweetening unit in a natural gas processing facility.

Module 2: Gas-Liquid Equilibrium and Thermodynamics

- Vapor-liquid equilibrium fundamentals
- Henry's Law applications
- Solubility and phase behavior analysis
- Thermodynamic models and calculations
- Process parameter sensitivity assessment
- **Case Study:** Solvent performance evaluation in CO? absorption systems.

Module 3: Absorber and Stripper Equipment Design

- Packed tower design principles
- Tray column configurations
- Internals and distributor systems
- Hydraulic performance evaluation
- Equipment selection criteria
- **Case Study:** Debottlenecking a refinery absorption column for increased throughput.

Module 4: Process Optimization and Energy Efficiency

- Energy consumption analysis
- Heat integration opportunities
- Process intensification strategies
- Sustainability and decarbonization initiatives
- Operational cost reduction techniques
- **Case Study:** Reducing steam consumption in a stripping column operation.

Module 5: Process Simulation and Digital Technologies

- Process modeling fundamentals
- Simulation software applications
- Digital twin concepts
- Real-time process monitoring
- AI and machine learning applications
- **Case Study:** Digital twin implementation for absorber performance enhancement.

Module 6: Operational Troubleshooting and Performance Improvement

- Flooding, weeping, and entrainment issues
- Column efficiency diagnostics
- Process upset management
- Root cause analysis techniques
- Reliability-centered optimization
- **Case Study:** Troubleshooting performance decline in a petrochemical stripping unit.

Module 7: Environmental Compliance and Carbon Management

- Air emissions control technologies
- Carbon capture and storage integration
- Environmental regulations and standards
- ESG and sustainability reporting
- Green process engineering practices
- **Case Study:** Carbon capture absorber optimization for emission reduction targets.

Module 8: Safety, Risk Management, and Best Practices

- Process safety management principles
- Hazard identification techniques
- Operational risk assessment
- Emergency response planning
- Industry best practices and lessons learned
- **Case Study:** Safety review and risk mitigation in high-pressure stripping operations.

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

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