Chemical Process Simulation Using Aspen HYSYS 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

Chemical industries today are rapidly evolving toward digitalization, process optimization, energy efficiency, and sustainable production, making advanced simulation skills essential for engineers. The Aspen HYSYS process simulation software is one of the most powerful tools used globally for steady-state simulation, dynamic modeling, process design, equipment sizing, and optimization of chemical and hydrocarbon systems. Chemical Process Simulation Using Aspen HYSYS Training Course is designed to equip participants with hands-on expertise in building, analyzing, and optimizing complex chemical processes using real industrial workflows.

This program focuses on developing strong competencies in process modeling, thermodynamic property packages, separation systems, heat integration, refinery simulation, gas processing, and troubleshooting plant operations. Through real-world case studies from oil & gas, petrochemical, refining, and chemical manufacturing industries, learners will gain practical experience in using Aspen HYSYS to improve plant efficiency, reduce operational costs, enhance safety, and support decision-making in process engineering environments.

Programme Curriculum

Chemical Process Simulation Using Aspen HYSYS Training Course

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Course Objectives

1. Master Aspen HYSYS process simulation environment
2. Develop skills in thermodynamic property package selection
3. Build steady-state and dynamic process simulation models
4. Perform PFD (Process Flow Diagram) and P&ID-based modeling
5. Conduct mass and energy balance optimization
6. Design and simulate distillation columns and separation units
7. Analyze heat exchangers and heat integration systems
8. Optimize refinery and petrochemical processes
9. Perform gas processing and LNG plant simulation
10. Execute equipment sizing and rating calculations
11. Improve process safety and operability analysis
12. Apply de-bottlenecking and process troubleshooting techniques
13. Gain expertise in industrial case-based process optimization

Target Audience

1. Chemical Engineers and Process Engineers
2. Petroleum and Petrochemical Engineers
3. Refinery Operations Engineers
4. Graduate Engineering Students (Chemical / Mechanical)
5. Plant Design and Commissioning Engineers
6. Process Safety and Optimization Engineers
7. R&D Engineers in Chemical Manufacturing
8. Energy and Sustainability Analysts

Course Modules

Module 1: Introduction to Aspen HYSYS & Process Simulation Basics

- Overview of Aspen HYSYS interface and tools
- Process simulation workflow
- Units, streams, and simulation hierarchy
- Property methods and thermodynamics selection
- Case Study: Basic natural gas separation process modeling

Module 2: Thermodynamics & Fluid Property Packages

- Equation of State (EOS) models
- Activity coefficient models
- Phase equilibrium calculations
- Fluid characterization and assays
- Case Study: Crude oil characterization for refinery feed

Module 3: Process Flow Diagram (PFD) Development

- Building complete PFD in Aspen HYSYS
- Stream definition and convergence methods
- Recycle and convergence handling
- Flow assurance and simulation stability
- Case Study: LPG recovery unit simulation

Module 4: Separation Processes Simulation

- Distillation column design and operation
- Flash drums and separators
- Absorption and stripping columns
- Multi-stage separation optimization
- Case Study: Crude distillation unit (CDU) modeling

Module 5: Heat Transfer & Energy Integration

- Heat exchanger modeling and rating
- Utility systems
- Heat integration and energy optimization
- Pinch analysis basics in HYSYS
- Case Study: Heat exchanger network optimization in refinery

Module 6: Gas Processing & LNG Systems

- Natural gas sweetening processes
- Amine treatment systems
- Dehydration
- LNG liquefaction basics
- Case Study: Gas sweetening plant simulation

Module 7: Refinery & Petrochemical Simulation

- Refinery process configuration
- FCC, hydrocracking, reforming units
- Blending and product optimization
- Yield improvement strategies
- Case Study: Refinery optimization for fuel production

Module 8: Dynamic Simulation & Troubleshooting

- Transition from steady-state to dynamic mode
- Control systems and instrumentation modeling
- Startup and shutdown simulation
- Fault detection and troubleshooting

- Case Study: Compressor surge control system analysis

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

Start Date	End Date	Location	Price
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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