

€ TRAINING

Aspen HYSYS and Process Modeling



23 March - 3 April 2025
Cairo (Egypt)



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REF: E764 DATE: 23 March - 3 April 2025 Venue: Cairo (Egypt) - Fee: 7590 Euro

Introduction:

Aspen HYSYS is a leading process simulation software used for modeling, analyzing, and optimizing chemical and hydrocarbon processes, enhancing efficiency and decision-making in industrial operations. This training program provides participants with the skills to effectively use Aspen HYSYS software for process simulation and modeling, enabling them to optimize operations, improve process design, and solve complex engineering challenges in real-world applications.

Program Objectives:

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

- Build and navigate process simulations using Aspen HYSYS.
- Utilize HYSYS functions to construct detailed process flowsheets.
- Optimize process simulations to improve performance and troubleshooting.
- Integrate multi-flowsheets for more efficient modeling.
- Evaluate equipment performance and determine optimum operating points using Aspen HYSYS's rating capabilities.

Targeted Audience:

- Process Engineers with experience in process simulation.
- Engineering graduates and technologists using Aspen HYSYS.
- Engineers working on process design, optimization, and studies.
- Plant engineers evaluating performance under various conditions.
- R&D engineers and researchers using Aspen HYSYS for process synthesis.

Program Outline:

Unit 1:

Propane Refrigeration Loop:

- Build and connect operations to create a simple flowsheet.

- Use the graphic interface for easy manipulation of flowsheet objects.
- Understand how information propagates through the system.
- Convert simulation cases into reusable templates.
- Analyze the propane refrigeration loop simulation.

Unit 2:

Refrigerated Gas Plant:

- Install and converge heat exchangers in the simulation.
- Utilize logical operations like Adjust and Balance.
- Model a simplified version of a refrigerated gas plant.
- Understand the impact of heat exchangers on overall system efficiency.
- Apply appropriate troubleshooting methods for heat exchanger operations.

Unit 3:

NGL Fractionation Train:

- Model distillation columns with Column Input Expert.
- Adjust column specifications to match process constraints.
- Use the Process Utility Manager to evaluate utility requirements.
- Model a two-column NGL recovery plant.
- Understand the impact of column operation on NGL recovery.

Unit 4:

Oil Characterization and HP Separation:

- Introduce Oil Characterization in Aspen HYSYS.
- Use spreadsheets and Case Study functionality for analysis.
- Characterize a crude assay and analyze Gas Oil Ratio GOR.
- Determine the pressure dependency of the GOR.

Unit 5:

Gas Gathering System:

- Simulate a gas gathering system using steady-state capabilities.
- Model a piping network with the pipe segment and Hydraulics subflowsheet.
- Apply Aspen HYSYS's features to model terrain variations.
- Evaluate system performance under different conditions.
- Troubleshoot issues in the gas gathering system.

Unit 6:

Two-Stage Compression:

- Introduce the recycling operation in the system.
- Implement performance curves for rotating equipment.
- Build a two-stage compression flowsheet.
- Define and activate compressor curves for simulation.
- Optimize compressor performance using Aspen HYSYS.

Unit 7:

Natural Gas Dehydration with TEG:

- Review hydrocarbon stream saturation methods.
- Understand the formation and prevention of hydrates.
- Model a typical TEG dehydration unit for water dew point control.
- Investigate the impact of methanol injection on hydrate inhibition.
- Use the hydrate utility to ensure proper dehydration conditions.

Unit 8:

Rating Heat Exchangers:

- Review heat transfer calculation models in Aspen HYSYS.
- Set up a shell and tube heat exchanger with built-in Rating models.

- Perform Exchanger Design and Rating EDR calculations.
- Design and rate a heat exchanger based on process specifications.
- Evaluate heat exchanger performance and compatibility with the system.

Unit 9:

Troubleshooting / Best Practices:

- Introduce best practices for process simulation integration.
- Troubleshoot common simulation errors and inconsistencies.
- Select appropriate thermodynamic models for different processes.
- Debug simulations and columns to resolve common issues.
- Recognize common problem areas in Aspen HYSYS cases.

Unit 10:

Reporting in Aspen HYSYS:

- Create custom reports using Aspen HYSYS Report Manager.
- Extract simulation data with Excel utilities.
- Deploy simulation models in Microsoft Excel using Aspen Simulation Workbook.
- Generate custom reports and analyze simulation results.
- Use the Report Manager to produce clear, accurate documentation of findings.