MERCURY

Aspen HYSYS Training Course for Beginners

18 – 22 April 2027
Cairo (Egypt)



Dubai - UAE: +971 4 450 5697
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Ref: 16365_1017649 **Date:** 18 – 22 April 2027 **Location:** Cairo (Egypt) **Fees:** 4000 Euro

Introduction:

The Aspen HYSYS Training Course for Beginners equips professionals entering the oil, gas, and petrochemical industries with foundational knowledge and practical skills in process simulation. This course provides a structured pathway to understand the fundamentals of process engineering, enabling learners to model, analyze, and optimize various chemical processes. Participants will gain confidence in using Aspen HYSYS software to perform essential simulations and design calculations.

The Aspen HYSYS Course for Beginners bridges theoretical knowledge with real-world applications. Participants will be able to build basic simulation flowsheets, perform material and energy balances, and troubleshoot simple process scenarios. The curriculum prepares learners to advance into mid-level simulation roles, ensuring a smooth transition into more complex engineering responsibilities. It provides a critical foundation for technical staff seeking to excel in process engineering and simulation.

Targeted Groups:

This Aspen HYSYS Training Course for Beginners targets professionals seeking specialized knowledge and skills:

- New Graduates entering the Oil & Gas / Petrochemical industry.
- Junior Process Engineers seeking practical simulation skills.
- Process Engineering Trainees starting their professional journey.
- Entry-Level Simulation Engineers aiming to enhance foundational knowledge.
- Mid-Level Process Engineers looking to strengthen simulation competencies.
- Operations Support Engineers require an understanding of process modeling.
- Process Analysts Beginner / Mid-Level seeking technical growth.
- Technical Staff transitioning into process engineering or simulation roles.

Course Objectives:

Participants will achieve the following objectives by completing the Aspen HYSYS Course for Beginners:

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- Understand core principles of process simulation using Aspen HYSYS.
- Develop basic process flowsheets for common chemical operations.
- Perform material and energy balance calculations accurately and precisely.
- Analyze process parameters and identify opportunities for optimization.
- Simulate key unit operations including distillation, heat exchangers, and reactors.
- Evaluate process behavior under varying operational conditions.
- Interpret simulation results for decision-making and process improvements.
- Troubleshoot simple errors and correct simulation inconsistencies.
- Apply foundational HYSYS tools for data entry, process modeling, and reporting.
- Enhance confidence in performing simulations for oil and gas processes.
- Build a systematic approach to process engineering problem-solving.
- Prepare for advanced simulation tasks and mid-level professional roles.

Targeted Competencies:

Participants will gain the following competencies during the Aspen HYSYS Program for Beginners:

- Proficiency in navigating the Aspen HYSYS interface and toolsets.
- Skill in creating basic process flowsheets.
- Ability to conduct energy and material balances.
- Competence in simulating unit operations like distillation and heat exchangers.
- Analytical skills to assess process performance.
- Capability to troubleshoot and resolve basic simulation errors.
- Knowledge of applying simulation to real-world chemical processes.
- Confidence in data entry and results interpretation.
- Understanding of process optimization techniques.
- Preparedness for progressing to intermediate simulation challenges.

Studying Scenarios:

In this Aspen HYSYS Training for Beginners, participants will develop their skills through the analysis of the following scenarios:

- Simulating a simple gas separation process and evaluating output purity.
- Modeling a single-stage distillation column and performing an energy balance.
- Conducting a material balance on a hydrocarbon feed stream.
- Evaluating temperature and pressure effects on reactor performance.
- Analyzing heat exchanger efficiency and optimization techniques.
- Investigating the impact of operational changes on process stability.
- Troubleshooting simulation flowsheet errors in a controlled environment.
- Comparing simulation outcomes against theoretical calculations.

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Course Content:

Unit 1: Introduction to Aspen HYSYS and Process Simulation:

- Overview of Aspen HYSYS software and its role in the industry.
- Understanding process simulation and modeling fundamentals.
- Navigating the HYSYS interface efficiently.
- Introduction to units and process property packages.
- Setting up a simple process flowsheet.
- Introduction to streams, units, and material properties.
- Managing data entry and simulation parameters.
- Understanding process simulation workflow.

Unit 2: Material and Energy Balances:

- Fundamentals of material balance in chemical processes.
- Performing energy balance calculations with HYSYS.
- Understanding conservation principles in simulation.
- Applying balances to simple unit operations.
- Troubleshooting balance inconsistencies.
- Introduction to process convergence techniques.
- Linking process streams to maintain mass and energy accuracy.
- Practical exercises for balance verification.

Unit 3: Simulation of Key Unit Operations:

- Modeling distillation columns for separation processes.
- Simulating heat exchangers and evaluating thermal efficiency.
- Basic reactor simulation and reaction kinetics.
- Pump and compressor modeling in HYSYS.
- Overview of separator operations and control.
- Performing simple process optimization exercises.
- Analyzing simulation results for each unit operation.

Unit 4: Process Analysis and Optimization:

- Introduction to sensitivity analysis and parametric studies.
- Evaluating process performance under different operating conditions.
- Identifying bottlenecks and optimization opportunities.
- Understanding process constraints and limits.
- Applying troubleshooting techniques for flowsheet issues.
- Practical scenarios of energy saving and efficiency improvement.
- Using HYSYS tools to document and present findings.
- Incorporating real-world operational adjustments into simulations.

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Unit 5: Practical Applications and Reporting:

- Creating simulation reports for engineering review.
- Interpreting results and making data-driven recommendations.
- Best practices for simulation documentation.
- Integrating multiple unit operations into complete flowsheets.
- Scenario-based exercises on real process applications.
- Case studies for oil, gas, and petrochemical processes.
- Preparing for further advanced simulation courses.
- Enhancing decision-making skills through simulation results.
- Summarizing learnings and applying them to professional tasks.

Final Insights & Key Takeaways:

By completing this Aspen HYSYS training course, participants at the beginner level will acquire the essential skills to perform process simulations with confidence and proficiency. Learners will bridge theoretical knowledge with practical applications in oil and gas processes. The course lays a strong foundation for professional growth into intermediate and advanced process engineering roles.