MERCURY

Advanced Aspen HYSYS Course

23 - 27 May 2027
Amman (Jordan)

Dubai - UAE: +971 4 450 5697
Istanbul - Türkiye: +90 539 599 1206
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Ref.: 16366_1017689 **Date:** 23 - 27 May 2027 **Location:** Amman (Jordan) **Fees:** 4200 **Euro**

Introduction:

The Advanced Aspen HYSYS course is ideal for senior leaders, expert consultants, and technical professionals in the oil, gas, and petrochemical industries. This course extends beyond the fundamentals to focus on advanced process modeling, simulation optimization, and operational excellence strategies.

Participants will learn how to leverage Aspen HYSYS for optimizing plant operations, enhancing energy efficiency, improving process safety, and making predictive operations. The Advanced Aspen HYSYS curriculum emphasizes both theoretical frameworks and practical applications in complex industrial environments.

The Advanced Aspen HYSYS program addresses real-world challenges, including debottlenecking, advanced thermodynamics, multiphase systems, and integration with process safety standards. It enables senior professionals to optimize asset performance, mitigate operational risks, and inform data-driven decision-making at the strategic level.

Targeted Groups:

This Advanced Aspen HYSYS training targets professionals seeking specialized knowledge and skills:

- Director of Process Engineering.
- Senior Process Engineering Manager.
- Lead Process Engineer.
- Principal Process Engineer.
- Head of Process Simulation & Optimization.
- Operations Excellence Director.
- Plant Optimization & Performance Manager.
- Technical Director Oil & Gas / Petrochemicals.
- Aspen HYSYS Expert Consultant / Certified Master.
- VP of Engineering & Projects Oil & Gas / Petrochemicals.
- Chief Process Engineer.
- Process Safety & Risk Management Lead.

Targeted Competencies:

Participants will gain the following competencies during the Advanced Aspen HYSYS program:

- Mastery in Aspen HYSYS advanced process modeling.
- Skills in debottlenecking and optimization for complex systems.
- Competence in designing energy-efficient process plants.
- Analytical expertise in multiphase and thermodynamic systems.
- Ability to conduct comprehensive safety and risk assessments.
- Decision-making skills based on simulation outputs.
- Leadership in process engineering strategy.
- Competence in linking process optimization with business performance.

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Course Objectives:

Participants will achieve the following objectives by the Advanced Aspen HYSYS course completion:

- Apply advanced simulation techniques for complex oil, gas, and petrochemical processes.
- Evaluate plant-wide performance through rigorous process integration models.
- Design and optimize energy recovery systems for enhanced operational efficiency.
- Analyze multiphase flow dynamics to ensure accurate process predictions.
- Assess and mitigate operational risks using HYSYS safety modeling tools.
- Optimize separation systems, reactors, and thermodynamic models for maximum yield.
- Interpret simulation outputs for decision-making in production and optimization.
- Implement advanced process control strategies for operational reliability.
- Recommend optimization pathways that align with corporate performance goals.
- Integrate Aspen HYSYS into strategic decision frameworks for long-term competitiveness.

Studying Scenarios:

In this Advanced Aspen HYSYS training, participants will develop their skills through the analysis of the following scenarios:

- Optimizing a refinery unit for improved energy efficiency.
- Simulating multiphase systems under varying operational conditions.
- Modeling emergency relief scenarios for safety validation.
- Debottlenecking a petrochemical plant to maximize throughput.
- Applying HYSYS for gas processing plant optimization.
- Evaluating heat integration opportunities in a complex facility.
- Simulating advanced distillation configurations to achieve higher yields.
- Analyzing plant-wide process changes under economic constraints.

Course Content:

Unit 1: Advanced Process Modeling and Thermodynamics in Aspen HYSYS:

- Introduction to advanced thermodynamic models for oil, gas, and petrochemical systems.
- Application of equations of state for accurate property predictions.
- Handling complex fluid characterization and pseudo-component creation.
- Modeling multiphase flow systems with detailed pressure drop analysis.
- Incorporating phase equilibrium and non-ideal behavior in simulation.
- Using custom property packages for unique feedstocks.
- Advanced heat exchanger and compressor modeling.
- Case studies on thermodynamic selection for challenging operations.

Unit 2: Optimization and Debottlenecking Strategies:

- Process optimization methodologies for large-scale plants.
- Identifying and resolving bottlenecks using HYSYS simulation tools.
- Strategies for maximizing throughput with existing assets.
- Optimizing distillation columns for energy and yield improvement.
- Debottlenecking fluid catalytic cracking FCC and hydrocracking units.
- Energy recovery systems integration and evaluation.
- Pinch analysis and heat integration modeling.
- Case studies in refinery and petrochemical optimization.

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Unit 3: Advanced Dynamic Simulation and Process Safety:

- Transitioning from steady-state to dynamic simulations.
- Modeling transient operations and start-up/shutdown scenarios.
- Safety Relief System Design and Validation Using HYSYS.
- Flare System Modeling and Pressure Safety Analysis.
- Dynamic Response of Critical Units to Process Disturbances.
- Risk analysis using simulation-based methodologies.
- Integration of HYSYS with safety lifecycle management.
- Real-world examples of dynamic modeling in critical facilities.

Unit 4: Plant-Wide Integration and Operations Excellence:

- Building plant-wide models integrating multiple units.
- Analyzing energy and material balances across the facility.
- Optimization of utility systems for reducing operational costs.
- Integrating Aspen HYSYS with planning and scheduling tools.
- Evaluating refinery-wide performance metrics.
- Linking plant simulation with operations excellence programs.
- Best practices for maintaining model accuracy over time.
- Industrial case studies on integrated optimization.

Unit 5: Strategic Applications and Digital Transformation with Aspen HYSYS:

- Leveraging HYSYS in digital twin applications.
- Using HYSYS models to drive predictive maintenance strategies.
- Linking HYSYS outputs to advanced process control systems.
- Applying HYSYS for sustainability and emissions reduction.
- Using simulation data for strategic project investment decisions.
- Enhancing corporate decision-making through simulation analytics.
- Future Trends in HYSYS Applications in AI and Machine Learning.
- Executive-level case studies on strategic adoption of HYSYS.

Final Insights & Key Takeaways:

The Advanced Aspen HYSYS course equips senior professionals with advanced tools to lead optimization, safety, and strategic decision-making. Participants gain the ability to drive efficiency and reliability across complex oil, gas, and petrochemical operations.

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Registration form on the :
Advanced Aspen HYSYS Course

code: 16366 **From:** 23 - 27 May 2027 **Venue:** Amman (Jordan) **Fees:** 4200 **Euro**

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