Process Simulation and Modeling with Aspen HYSYS Training Course



14 - 18 Dec 2026

Boston

7500 € (Per Person)

Ref: #ACE8999_59766

Course Introduction / Overview:

This training course gives a comprehensive look into the principles of process simulation using Aspen HYSYS, a leading software in the field. Process simulation is a crucial tool for chemical engineers and plant operators, allowing for the virtual design, analysis, and optimization of chemical processes before they are built. This reduces costs, minimizes risks, and enhances efficiency. This course gives a solid foundation in using the Aspen HYSYS interface, from building basic flowsheets to performing complex calculations for mass and energy balances. We explore how to model various unit operations, including heat exchangers, reactors, and distillation columns, and how to troubleshoot common simulation issues. The curriculum is informed by leading academic and industry resources, such as the book Chemical Process Simulations using Aspen Hysys by Khalid W. Hameed, which gives a comprehensive guide to the software's use. BIG BEN Training Center is committed to giving a forward-thinking curriculum that equips professionals with the skills needed to use process simulation effectively in their work.

Target Audience / This training course is suitable for:

- Process engineers.
- Chemical engineers.
- Plant operations staff.
- R&D and design engineers.
- Engineering and technical consultants.
- Students and academics in chemical engineering.
- Project managers in process industries.

Target Sectors and Industries:

- Oil and gas.
- Petrochemicals.
- Chemical manufacturing.
- Energy and power generation.
- Pharmaceuticals.
- Government agencies and research institutes.
- Engineering, procurement, and construction (EPC) firms.

Target Organizations Departments:

- Process design and engineering.
- Operations and technical services.
- Research and development.
- Asset management.
- Health, safety, and environment.
- Energy management.
- Manufacturing.

Course Offerings:

By the end of this course, the participants will have able to:

- Navigate the Aspen HYSYS user interface and build a new simulation.
- Select the correct thermodynamic models for a given process.
- Model key unit operations like heat exchangers and distillation columns.
- Perform mass and energy balances for a process flowsheet.
- Use the software to conduct sensitivity analyses and case studies.
- Troubleshoot common convergence and simulation errors.
- Apply Aspen HYSYS for process optimization and design.
- Generate reports and analyze simulation results.

Course Methodology:

This training course uses a mix of theoretical instruction, guided exercises, and hands-on projects to give a dynamic learning experience. The curriculum combines theoretical lectures with real-world case studies to bridge the gap between academic concepts and practical application. Participants will use hands-on activities, including group workshops and scenario-based exercises, to reinforce their understanding of key topics. We use discussions and Q&A sessions to encourage a collaborative learning environment, where participants can share experiences and insights. The course also includes an in-depth analysis of successful and unsuccessful projects from various industries to highlight best practices and common pitfalls. This approach gives participants the confidence to apply their new knowledge directly to their professional roles. At BIG BEN Training Center, we believe that an engaging and interactive format is key to mastering new skills, so we focus on giving immediate feedback and continuous support throughout the training. The methods are designed to ensure every participant leaf with a clear, practical skill set.

Course Agenda (Course Units):

Unit One: Introduction to Process Simulation with Aspen HYSYS.

- Overview of process simulation and its benefits.
- Navigating the Aspen HYSYS user interface.
- Component and fluid package selection.
- Building and managing a process flowsheet.
- Basic stream and property analysis.

Unit Two: Modeling Basic Unit Operations.

- Simulating pumps, compressors, and expanders.
- Modeling heat exchangers and coolers.
- Flash separators and two-phase separators.
- Valves and pipes.
- Creating and customizing workbooks.

Unit Three: Advanced Modeling and Thermodynamics.

- Property packages and their application.
- Modeling reactors and reaction sets.
- Simulating distillation and absorption columns.
- Using spreadsheets and logical operations.
- Characterizing hypothetical components and crude oil.

Unit Four: Analysis and Optimization.

- Running sensitivity analyses.
- Performing case studies to find optimal conditions.
- Using the optimizer tool.
- Troubleshooting convergence errors.
- Best practices for building robust simulations.

Unit Five: Dynamic Simulation and Reporting.

- Introduction to dynamic simulation.
- Setting up a dynamic case.
- Dynamic control and analysis.
- Using the Aspen Simulation Workbook.
- Creating custom reports and exporting data.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

How can Aspen HYSYS simulation be integrated with real-time plant data to create a living digital twin for a chemical process, enabling predictive maintenance and proactive optimization?

What unique qualities does this course offer compared to other courses?

This training course is unique because it combines a strong theoretical foundation in process simulation with intensive, hands-on practice using Aspen HYSYS, the industry-standard software. While many courses give a general overview of the software, our program is designed to give participants a deep and practical mastery of the tools and techniques needed for real-world applications. We don't just teach you what the buttons do; we help you find out how to model, analyze, and optimize processes from start to finish. The curriculum is heavily focused on case studies and problem-solving exercises, enabling participants to build confidence in their ability to use the software for complex industrial challenges. It’s an advanced program that gives professionals the skills needed to drive process innovation and efficiency in their organizations.