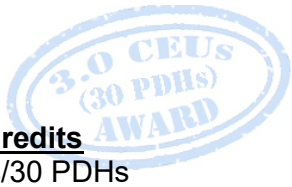
COURSE OVERVIEW PE0344
HYSYS Process Simulation - Advanced

Course Title
HYSYS Process Simulation – Advanced

Course Date/Venue
Session 1: April 06-10, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
Session 2: September 08-12, 2025/ Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
PE0344



Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description

This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

Dynamic simulation can help the participants to better design, optimize and operate the chemical process or refining plant. Chemical plants are never truly at steady state. Feed and environmental disturbances, heat exchanger fouling and catalytic degradation continuously upset the conditions of a smooth running process. The transient behavior of the process system is best studied using a dynamic simulation tool like ASPEN HYSYS.

With dynamic simulation, participant can investigate:

- Process Optimization
- Controller Optimization
- Safety Evaluation
- Transitions between operation conditions
- Start-up/shutdown conditions

The ASPEN HYSYS dynamic model shares the same physical property packages as the steady state model. The dynamic model simulates the thermal, equilibrium and reactive behavior of the chemical system in a similar manner as the steady state model.

Course Description

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain an advanced knowledge on process simulation with ASPEN and HYSYS
- Use and apply advanced modeling techniques to enhance existing Aspen HYSYS flowsheets
- Create custom column templates including non-standard configurations
- Perform complex calculations on flowsheet variables using the Spreadsheet
- Realistically simulate separator carryover
- Optimize process conditions to meet one or more process constraints
- Integrate rigorous heat exchanger models into a standard flowsheet
- Define reaction sets and utilize different types of reactors

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course is intended for process engineers who need advanced skills for more complex modeling tasks as well as R&D engineers and researchers using Aspen HYSYS for process synthesis, upgrade or modifications.

Exam Eligibility & Structure

Exam Candidates shall have the following minimum prerequisites:-

- Attend Aspen HYSYS: Process Modeling training course or have equivalent modeling experience
- Familiarity with Aspen HYSYS steady-state modeling concepts

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations:-

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Yasser Almasood is a **Senior Process & Petroleum Engineer** with almost **20 years** of industrial experience within the, **Oil & Gas**, **Refinery** and **Petrochemical** industries. His wide expertise covers in the areas of **Gas Processing** Calculation, **Process Reactor** Operation & Troubleshooting, **Catalytic Reactors**, **Heat Exchanger**, **Distillation Columns**, **Pumps**, Distributed Control System (**DCS**), **Catalytic Reformer Unit**, **Polymerization**, **Dehydrogenation**, **Gas Processing Plant** Operations & Control, **Gas Processing** Monitoring & Troubleshooting, **Process Plant Start-up** Commissioning & Troubleshooting, **Process Plant** Optimization & Energy Conservation, **Process Equipment** Design & Troubleshooting, **Advanced Operation Skills**, **Refinery Process Yield Optimization**, **Oil & Gas Processing**, Troubleshooting Oil & Gas Processing Facilities, **Polymers & Polymerization**, Applied **Process Engineering**, **Process Plant** Troubleshooting & Engineering Problem Solving, **Process** Plant Performance & Efficiency, **Flare Blowdown & Pressure Relief Systems**, **Polypropylene** Manufacturing, **Polyethylene** & Process Troubleshooting, **Ammonia**, **Ethylene**, **Solvents**, **Gas Feed**, **EDC**, **VCM**, **PP**, **PVC**, **Chlorine**, **Fluidized Bed Reactor**, **Oil Movement & Storage**, **Power Plant Chemistry**, **Catalyst** Manufacturing Techniques, **Fuel Systems** Management, **Process Design & Optimization**, **Desalination Processes**, **Reverse Osmosis** and **Molecular Sieves**. Further, he is also well-versed in **HAZOP**, Advanced **Process Hazard Analysis**, **Safety** Management, **Environmental Safety** Management, **LOPA & SIL**, Process Safety Management (**PSM**), **Incident investigation & Root Cause Analysis**, **Emergency & Crisis Management**, **Safety Audit & Site**, Inspection, Inspection of Fire Equipment & Tools, **Fire Protection & Prevention**, Worker Protection from Radiation Work Permits, IGC International General Certificate in Occupational Safety & Health, **Risk Assessment**, **Risk Associated** with Low Level Radiation Exposure, Hydrogen Sulfide (**H2S**) Safety, **Personal Protective Equipment**, **Lock-Out & Tag-Out**, **OSHA** Occupational Safety & Health, Radiation & Contamination, Scientific Notation, Exposure Rate & Shielding Calculations, **Excavations & Trenching**, **Permit-to-Work**, Aspentech, Aspen HYSYS, Pro II, exSILentia, OLGA, Flare System Analyzer, Aspen PIMS, DYNSIM, RiskWISE, MS Office and IBM Maximo.

During his career life, Mr. Yasser has gained his practical and field experience through his various significant positions and dedication as the **Senior Process Engineer**, **Process Engineer**, **Oil & Gas Process & Safety Instructor**, **On-Job Instructor**, **Process Senior Operator**, **Acting DCS Operator** and **Shift Controller** for various multi-national companies such as the ADNOC Gas Processing (**GASCO**), Conoco Phillips Gas Plant and Syrian Gas Company (SGC).

Mr. Yasser has a **Bachelor** degree in **Petroleum Engineering**. Further, he is a **Certified Instructor/Trainer** and has further delivered numerous training, courses, workshops, seminars and conferences worldwide.

Course Fee

US$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction/Safety Moment*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Getting Started*** *Use Core Flowsheeting Functionality to Build a Turbo Expander Plant Flowsheet with a Multi-Pass Exchanger and other Key Unit Operations (Heater, Separator, Column, Set)*
0930 - 0945	*Break*
0945 – 1100	***Getting Started (cont'd)*** *Use Core Flowsheeting Functionality to Build a Turbo Expander Plant Flowsheet with a Multi-Pass Exchanger and other Key Unit Operations (Heater, Separator, Column, Set) (cont'd)*
1100 – 1215	***Getting Started: Workshop*** *Use the Aspen HYSYS LNG Exchanger to Simulate Multi-Pass Exchangers ● Add Columns Using the Input Expert*
1215 – 1230	*Break*
1230 – 1420	***Getting Started: Workshop (cont'd)*** *Customize the Workbook and PFD ● Use Stream Property Correlations*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0930	***Extending HYSYS Functionality*** *Demonstrate How Automation can be Used to Increase the Capabilities of Aspen HYSYS*
0930 – 0945	*Break*
0945 – 1100	***Extending HYSYS Functionality: Workshop*** *Create a User Variable to Report User Defined Quantities ● Use Aspen Simulation Workbook to Create a Custom Interface*
1100 – 1215	***Advanced*** *Simulate Columns that do not Adhere to the Usual Configurations*
1215 – 1230	*Break*
1230 – 1420	***Advanced Columns: Workshop*** *Customize a Column with a Sizable Heat Exchanger ● Perform Tray Sizing and Rating Calculations Using the Tray Sizing Utility*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Spreadsheets and Case Studies*** *Use a Spreadsheet to Calculate a Simplified Profit for the Turbo Expander Plant*

0930 – 0945	Break
0945 – 1100	***Spreadsheets and Case Studies: Workshop*** *Import and Export Variables to and from the Spreadsheet ● Add Complex Formulas ● Use the Case Study to Evaluate Flowsheet Scenarios*
1100 – 1215	***Optimization*** *Use the Optimization Feature in Aspen HYSYS to Identify Optimal Operating Conditions*
1215 – 1230	Break
1230 – 1420	***Optimization: Workshop*** *Use the Available Optimization Methods to Maximize Profit in a Turbo Expander Plant Flowsheet*
1420 – 1430	***Recap***
1430	Lunch & End of Day Three

Day 4

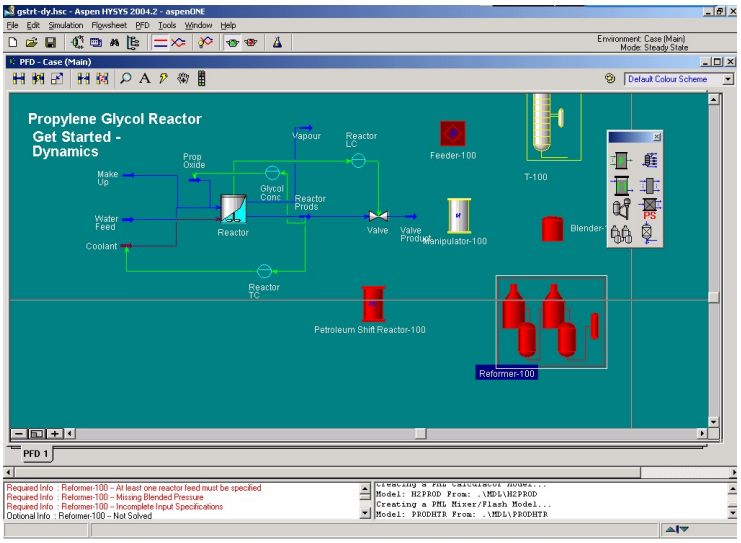
0730 – 0930	***Modeling Real Separators*** *Model Liquid/Vapor Carryover so that your Model Matches your Process Mass Balance or Separator Design Specification*
0930 – 0945	Break
0945 – 1100	***Modeling Real Separators: Workshop*** *Estimate Carryover Based on Vessel Geometry and Inlet Conditions ● Model an Exit Device to Reduce Liquid Carryover*
1100 – 1215	***Dynamic Depressurization*** *Size and Rate Pressure Safety Valves to Safely Meet Plant Conditions Using the Dynamic Depressuring Utility*
1215 – 1230	Break
1230 – 1420	***Dynamic Depressurization: Workshop*** *Use the Dynamic Depressuring Utility to Size a Blowdown Valve for a Vessel and Size a PSV for a Fire Case*
1420 – 1430	***Recap***
1430	Lunch & End of Day Four

Day 5

0730 – 0930	***Reactions*** *Specify Equilibrium and Conversion Reactors using Reaction Sets Defined in the Simulation Basis*
0930 – 0945	Break
0945 – 1100	***Reactions: Workshop*** *Model a Simplified Synthesis Gas Flowsheet Using a Variety of Reactor Types*
1100 – 1215	***Heat Exchanger Rating*** *Convert an Existing Heat Exchanger from a Simple Design Model to a Rigorous Rating Model*
1215 – 1230	Break
1230 – 1345	***Heat Exchanger Rating: Workshop*** *Use Aspen Shell and Tube Exchanger as the Rating Engine for A Heat Exchanger Inside Aspen HYSYS*
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch End of Course*

Simulator (Hands-on Practical Sessions)

Practical session will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the simulator "Aspen Hysys".



ASPEN HYSYS

Course Coordinator

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