COURSE OVERVIEW PE0358-4D
Aspen HYSYS (EHY101 EHY202)

Course Title
Aspen HYSYS (EHY101 EHY202)

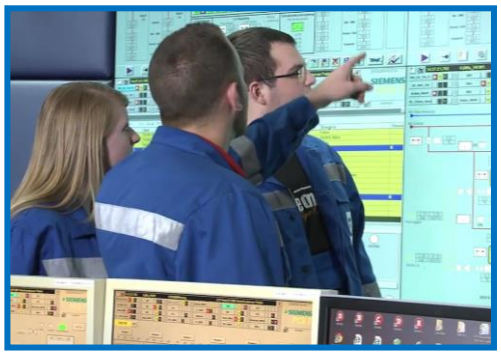
Course Date/Venue
December 09-12, 2024/Ogair Meeting Room, Crowne Plaza Al Khobar, Al Khobar, KSA

Course Reference
PE0358-4D

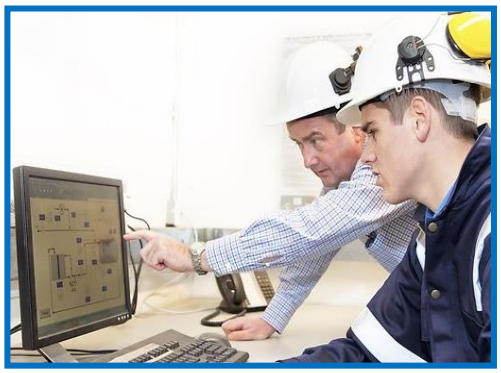
Course Duration/Credits
Four days/2.4 CEUs/24 PDHs

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.



This course is designed to provide participants with a detailed and an up-to-date overview of Aspen HYSYS (EHY101 EHY202). It covers the fluid package and select components, including hypotheticals; the stream property calculations, stream utilities and workbook; the propane refrigeration loop and add operations to build a simple flowsheet; the forward-backward information propagation and convert simulation cases to templates; the two-stage compression and use of recycle operation in aspen HYSYS; the suitable tear location for recycles and discuss water content and natural gas hydrates; AND the single and two phase stream.



Further, the course will also discuss the hydrate formation temperatures and pressures; the hydrate inhibition using methanol; the gas gathering system and using the pipe segment to model pipelines; the refrigerated gas plant including install and converge heat exchangers; the HP and JT separators; the oil characterization using boiling point assay data and the aspen HYSYS oil manager; the use of the aspen HYSYS spreadsheet to perform calculations; and the NGL fractionation train.

During this interactive course, participants will learn;; the model de-methanizer, de-ethanizer, and de-propanizer columns using column input expert; troubleshooting and reporting in aspen HYSYS; the compressor, pump curves and rating heat exchangers; the natural gas dehydration with teg and the water dewpoint for a gas; the core flowsheeting functionality to build a turbo expander plant flowsheet with a multi-pass exchanger and other key unit operations (heater, separator, column, set); the extending HYSYS functionality and how automation can be used to increase the capabilities of aspen HYSYS; the advanced columns, spreadsheets and case studies; the optimization, modeling real separators, dynamic depressurization, reactions and heat exchanger rating.

Course Objectives

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

- Apply and gain an in-depth knowledge on aspen hysys (EHY101 EHY202)
- Define fluid package and select components, including hypotheticals
- Perform stream property calculations and define stream utilities and workbook
- Discuss propane refrigeration loop and add operations to build a simple flowsheet
- Explain forward-backward information propagation and convert simulation cases to templates
- Identify the two-stage compression and use of recycle operation in aspen HYSYS
- Define suitable tear location for recycles and discuss water content and natural gas hydrates
- Carryout saturating a single and two phase stream
- Determine hydrate formation temperatures and pressures and simulate hydrate inhibition using methanol
- Discuss gas gathering system and carryout using the pipe segment to model pipelines
- Discuss refrigerated gas plant including install and converge heat exchangers
- Differentiate HP and JT separators and recognize oil characterization using boiling point assay data and the aspen HYSYS oil manager
- Carryout the use of the aspen HYSYS spreadsheet to perform calculations
- Discuss the NGL fractionation train comprising of model de-methanizer, de-ethanizer, and de-propanizer columns using column input expert
- Carryout troubleshooting and reporting in aspen HYSYS
- Discuss compressor and pump curves as well as rating heat exchangers
- Discuss the natural gas dehydration with teg and determine the water dewpoint for a gas
- Demonstrate core flowsheeting functionality to build a turbo expander plant flowsheet with a multi-pass exchanger and other key unit operations (heater, separator, column, set)
- Carryout extending HYSYS functionality and demonstrate how automation can be used to increase the capabilities of aspen HYSYS
- Determine the advanced columns, spreadsheets and case studies
- Discuss optimization, modeling real separators, dynamic depressurization, reactions and heat exchanger rating

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 provides an overview of all practical aspects and aspen HYSYS (EHY101 EHY202) for Process engineers who need advanced skills for more complex modeling tasks R and D engineers and researchers using Aspen HYSYS for process synthesis, upgrade or modifications.

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 Fee

US$ 4,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

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

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:-

- 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 **2.4 CEUs** (Continuing Education Units) or **24 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.

- 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.

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. Henry Beer is a **Senior Process Engineer** with over **35 years** of indepth industrial experience within the **Petrochemical**, **Oil & Gas** industries specializing in **Hydrocarbon Process** Equipment, **DOX Unit** Operation & Troubleshooting, **Polyethylene & Polypropylene** Processing, **Oil Movement** Storage & Troubleshooting, **Power Plant Chemistry**, **Aspen HYSYS** Training, **Fuel Quality** Monitoring System Fundamentals, **Liquid Bulk Cargo Handling**, **Oil Refinery Cost Management**, **Flare & Blowdown** Operation, **Pressure Relief Systems** Maintenance & Troubleshooting, Refinery **SRU**, **Tail Gas** Treating, **Sour Water & Amine Recovery** Units, **Propylene** Compressor and Turbine, **Clean Fuel** Technology & Standards, Principles of **Operations Planning**, **Heat Exchangers & Fired Heaters** Operation & Troubleshooting, **Plastic Extrusion Technology** Operation & Troubleshooting, **Chemical Engineering** for Non-Chemical Engineers, **Process Plant** Troubleshooting, **Process Plant Optimization** Technology, **Engineering Problem Solving**, **Process Plant** Performance & Efficiency, **Process Plant** Start-up & Shutdown, **Process Plant** Commissioning, **Process Plant** Turn-around & Shutdown, **Pumps & Compressors** Troubleshooting, **Fired Heaters & Air Coolers** Maintenance, **Pressure Vessels & Valves** Repair, **Polymers**, **Plastics**, **Polyolefin** & **Catalysts**, **Polymerization**, **Thermal Analysis Techniques**, **Rheology**, **Thermoplastics**, **Thermosets**, **Coating Systems** and **Fibre Reinforced Polymer Matrix Composites**. Further, he is also well-versed in **Water Hydraulic Modelling**, **Efficient** Shutdowns, Turnaround & Outages, **Pump** Selection and Installation, Operation and Maintenance of **Pumps**, **Demand & Supply** Management, **Catalyst Manufacturing Techniques**, **Fuel Systems Management**, **Aviation Fuel**, **Diesel**, **Jet Fuel**, **Petrol** and **IP Octane**, **Cetane Control** and related Logistics, Road, Rail and Pipeline Distribution, **Process Design** and **Optimisation**, **Boiler Feed Water Preparation**, **Flocculation Sedimentation**, **Hot Lime Water Softening Processes**, **Desalination Processes**, **Reverse Osmosis**, **Molecular Sieves**, activated **Sludge Aerobic/Anaerobic**, **Sludge Removal** and **Incineration Process Control**, **Domestic Sewage Plants Optimisation**, **Process Cooling Water System**, **High Pressure** and **Low Pressure Tank Farm Management**, **Hydrocarbon** and **Chemical products** and **GTL** (**Gas to Liquids**).

During his career life, Mr. Beer holds significant key positions such as the **Director**, **Global Commissioning Manager**, **Process Engineering Manager**, **Senior Business Analyst**, **Process Engineer**, **Chemical Engineer**, **Senior Technician**, **Technical Sales Engineer**, **Entrepreneur**, **Financial Consultant**, **Business Analyst**, **Business Financial Planner** and **Independent Financial Planner** to various international companies such as the **Sasol**, **SASOLChem**, **TAG Solvents**, **Virgin Solvent Products**, **SARS** & **SAPIA** (**South African Petroleum Industry Association**) and **RFS Financial Services** (**Pty**) **Ltd**.

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: ***Monday, 09th of December 2024***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Getting Started*** *Define a Fluid Package and Select Components, Including Hypotheticals • Perform Stream Property Calculations • Attach Stream Utilities • Customize the Workbook*
0930 – 0945	*Break*
0945 – 1100	***Propane Refrigeration Loop*** *Add Operations to Build a Simple Flowsheet • Understand Forward-Backward Information Propagation • Convert Simulation Cases to Templates*
1100 – 1230	***Two-Stage Compression*** *Use the Recycle Operation in Aspen HYSYS • Choose Suitable Tear Location for Recycles*
1230 – 1245	*Break*
1245 – 1330	***Water Content & Natural Gas Hydrates*** *Saturate a Single and Two Phase Stream • Determine Hydrate Formation Temperatures and Pressures • Simulate Hydrate Inhibition Using Methanol*
1330 – 1420	***Gas Gathering System*** *Use the Pipe Segment to Model Pipelines*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: ***Tuesday, 10th of December 2024***

0730 – 0830	***Refrigerated Gas Plant*** *Install and Converge Heat Exchangers • Use Logical Operations: Adjust and Balance • Use the Case Study Tool to Perform Case Studies on Your Simulation*
0830 – 0930	***HP & JT Separators*** *Oil Characterization Using Boiling Point Assay Data and the Aspen HYSYS Oil Manager • Use of the Aspen HYSYS Spreadsheet to Perform Calculations*
0930 – 0945	*Break*
0945 – 1100	***NGL Fractionation Train*** *Model de-Methanizer, de-Ethanizer, and de-Propanizer Columns Using Column Input Expert • Add Extra Performance Specifications to the Columns*
1100 – 1230	***Troubleshooting*** *Recognize, Interpret and Troubleshoot Common Problem Areas in Aspen HYSYS • Learn Tips and Tricks to Ensure Column Convergence*
1230 – 1245	*Break*
1245 – 1330	***Reporting in Aspen HYSYS*** *Customize Reports in Aspen HYSYS Using the Report Manager • Use XML to Create Summary of the Input Data from a Case • Use the Aspen Simulation Workbook to Deploy Models via Microsoft Excel*
1330 – 1420	***Compressor & Pump Curves*** *Specify and Attach Single and Multiple Head and Efficiency Curves to Compressors and Pumps*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3: Wednesday, 11th of December 2024

0730 – 0830	***Rating Heat Exchangers*** *Use the Dynamic Rating Method (by Providing Heat Exchanger Geometry) to Determine if an Existing Heat Exchanger will Meet Process Specifications*
0830 – 0930	***Natural Gas Dehydration with TEG*** *Model a Typical TEG Dehydration Unit • Determine the Water Dewpoint for a Gas*
0930 – 0945	*Break*
0945 – 1100	***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) • Workshop: Use the Aspen HYSYS LNG Exchanger to Simulate Multi-Pass Exchangers • Add Columns Using the Input Expert • Customize the Workbook and PFD • Use Stream Property Correlations*
1100 – 1230	***Extending HYSYS Functionality*** *Demonstrate how Automation can be used to Increase the Capabilities of Aspen HYSYS • Workshop: Create a User Variable to Report User Defined Quantities • Use Aspen Simulation Workbook to Create a Custom Interface*
1230 – 1245	*Break*
1245 – 1330	***Advanced Columns*** *Simulate Columns that do not Adhere to the Usual Configurations • Workshop: Customize a Column with a Sizable Heat Exchanger • Perform Tray Sizing and Rating Calculations Using the Tray Sizing Utility*
1330 – 1420	***Spreadsheets & Case Studies*** *Use a Spreadsheet to Calculate a Simplified Profit for the Turbo Expander Plant • Workshop: Import and Export Variables to and from the Spreadsheet; add Complex Formulas • Use the Case Study to Evaluate Flowsheet Scenarios*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

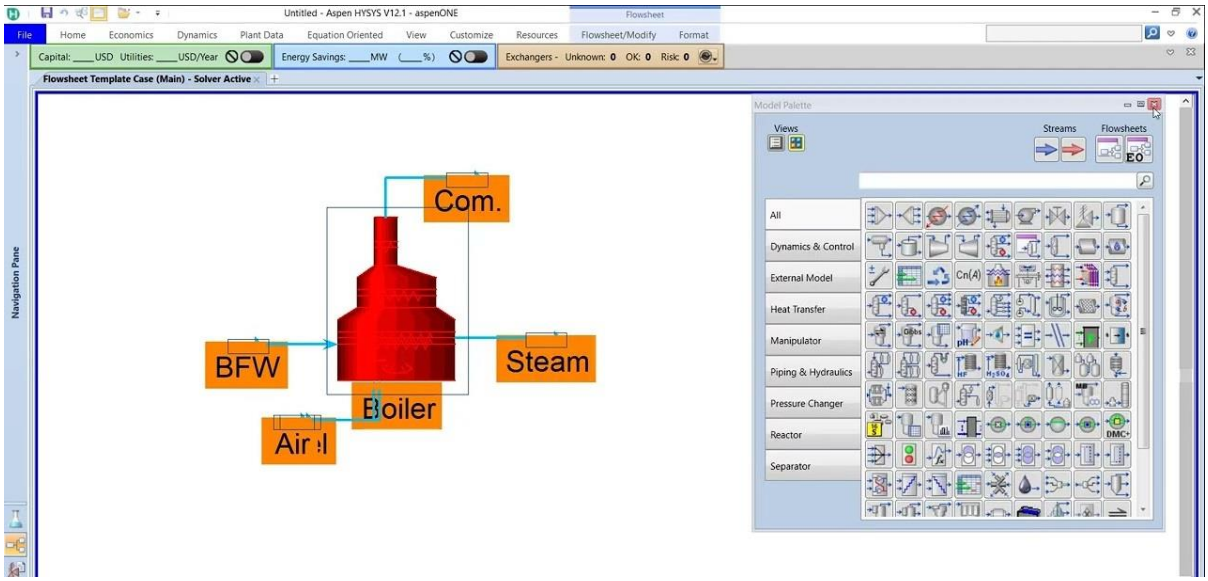
Day 4: Thursday, 12th of December 2024

0730 – 0830	***Optimization*** *Use the Optimization Feature in Aspen HYSYS to Identify Optimal Operating Conditions • Workshop: Use the Available Optimization Methods to Maximize Profit in a Turbo Expander Plant Flowsheet*
0830 – 0930	***Modeling Real Separators*** *Model Liquid/Vapor Carryover so that your Model Matches your Process Mass Balance or Separator Design Specification • Workshop: Estimate Carryover Based on Vessel Geometry and Inlet Conditions • Model an Exit Device to Reduce Liquid Carryover*
0930 – 0945	*Break*
0945 – 1100	***Dynamic Depressurization*** *Size and Rate Pressure Safety Valves to Safely Meet Plant Conditions Using the Dynamic Depressuring utility • Workshop: Use the Dynamic Depressuring Utility to Size a Blowdown Valve for a Vessel and Size a PSV for a Fire Case*
1100 – 1230	***Reactions*** *Specify Equilibrium and Conversion Reactors Using Reaction Sets Defined in the Simulation Basis • Workshop: Model a Simplified Synthesis Gas Flowsheet Using a Variety of Reactor Types*

1230 – 1245	*Break*
1245 – 1345	***Heat Exchanger Rating*** *Convert an Existing Heat Exchanger from a Simple Design Model to a Rigorous Rating Model • 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 sessions 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 our state-of-the-art "ASPEN HYSYS" simulator.



ASPEN HYSYS V12.1 Simulator

Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org