COURSE OVERVIEW PE0204
Hydrotreating Unit Operation

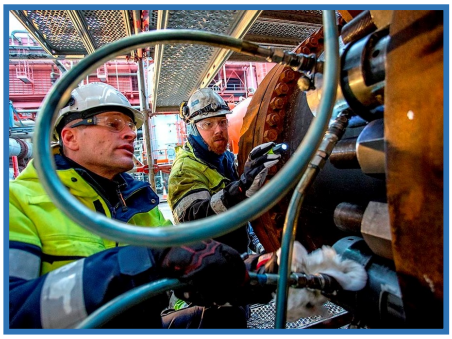
Course Title
Hydrotreating Unit Operation

Course Date/Venue
Session 1: January 27-31, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
Session 2: August 24-28, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
PE0204

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

Course Description



This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

Process reactors are vessels designed to contain chemical reactions. The design of a process reactor deals with multiple aspects of process engineering. Process engineers design reactors to maximize net present value for the given reaction. Designers ensure that the reaction proceeds with the highest efficiency towards the desired output product, producing the highest yield of product while requiring the least amount of money to purchase and operate. Normal operating expenses include energy input, energy removal, raw material costs, labor, etc. Energy changes can come in the form of heating or cooling, pumping to increase pressure, frictional pressure loss or agitation.

Both tank and tubular reactors can be used as continuous reactors or batch reactors, and either may accommodate one or more solids (reagents, catalyst, or inert materials), but the reagents and products are typically fluids. Most commonly, reactors are run at steady-state, but can also be operated in atransient state. When a reactor is first brought into operation (after maintenance or inoperation) it would be considered to be in a transient state, where key process variables change with time.

This course is designed to provide delegates with an up-to-date knowledge on the operation, troubleshooting, start-up and shutdown of process reactors. It covers the various techniques of chemical reactions; operating variables of process reactors such as pressure, temperature, hydrogen ratio, R/G ratio and LHSV; start-up guidelines and emergency shutdown procedures for process reactors; proper safety rules for reactor operation; and the reaction mechanism involved in process reactors.

Participants will be able to discuss the process control and troubleshooting techniques of process reactors; employ proven start-up and shutdown procedures and have an in-depth understanding of the catalyst regeneration procedure; apply feed preparation, catalyst deactivation and catalyst poisoning; and determine the different types of catalyst.

Course Objectives

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

- Operate, troubleshoot, start-up and shutdown process reactors in a professional manner
- Apply the techniques of chemical reactions and identify the various operating variables of process reactors such as pressure, temperature, hydrogen ratio, R/G ratio and LHSV
- Employ proven start-up guidelines and emergency shutdown procedures for process reactors
- Implement proper safety rules for reactor operation and analyze the reaction mechanism involved in process reactors
- Discuss polymerization of olefins as well as operate process control unit and troubleshoot process reactors
- Employ proven start-up and shutdown procedures and have an in-depth understanding of the catalyst regeneration procedure
- Apply feed preparation, catalyst deactivation, catalyst poisoning and be able to determine the different types of catalyst

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 a complete and up-to-date overview of the process reactor operation, troubleshooting, start-up and shutdown for process engineers, production engineers, section heads, shift supervisors and other operational staff.

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.

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. Attalla Ersan, PEng, MSc, BSc, is a **Senior Process Engineer** with over **35 years** of extensive experience within the **Oil & Gas**, **Hydrocarbon** and **Petrochemical** industries. His expertise widely covers the areas of **Process Simulation Using Aspen Hysys & UniSim**, **Process Modelling**, **Process Design**, **Process Plant** Operations, **Process Plant Startup & Operating Procedure**, **Ethylene & Vinyl Chloride**, **Ethane Cracking Furnaces** Operations, **Ethylene & Polyethylene** Operation, **Acid Gas Treatment**, **Sulphur Recovery**, **EDC & VCM**, Caustic Soda Storage, Debottle-necking, **Process Operation**, **Safety Audits**, **Process Engineering**, **Root Cause Investigations**, **Pyrolysis Cracking**, **Gas Plant Commissioning**, **Loss Prevention Techniques**, **Occupational Hazards**, Hot Tapping & Tie-Ins, Pre-Start-Up Safety Review (**PSSR**), Standard Operating Procedure (**SOP**), Emergency Operating Procedure (**EOP**), Permit to Work Systems (**PTW**), **Steam Cracking**, **Steam Generation**, **Binary Fractionators** Operations, **Tanks Farm & Metering Station Techniques**, **Gas Treatment**, **Sulphur Recovery Process Unit Operation**, **Permit to Work System**, **Emergency Response Planning**, **Boiler & Steam System** Management, **Waste Heat Recovery**, **Boiler Plant Safety**, **Boiler Controls**, **Steam Distribution** Systems, **Steam Traps**, Pollution Control, Cracked **Gas Compressor**, **Reboilers**, **Sulphur Unit Air Blower**, **Steam Turbine**, **Distillation Columns**, **Gas Treatment**, **Waste & Water Treatment Units**, **Pumps**, **Compressors**, **Turbines**, **Motors**, **Turbo-expanders**, **Gears**, **Heat Exchanger**, Hazard and Operability (**HAZOP**) Study, Process Hazards Analysis (**PHA**), **HAZOP** Facilitation, **Loss Prevention**, Consequence Analysis Application, **Gas Detectors** Operation, **Accident/Incident Investigation (Why Tree Method)**, **Occupational Exposure Assessment**, **Fire Fighting & First Aid**, **Environmental Management** and **Basic Safety** Awareness. Further, he is also well-versed in Project Management, Human Resources Consultancy, Manpower Planning, Job Design & Evaluation, Recruitment, Training & Development and Leadership, Creative Problem Solving Skills, Work Ethic, Job Analysis Evaluation, Training & Development Needs, Bidding & Tendering, Technical Report Writing, Supervisory Leadership, Effective Communication Skills and Total Quality Management (TQM). He is currently the **CEO** of **Ersan Petrokimya Teknoloji Company Limited** wherein he is responsible for the design and operation of Biogas Process Plants.

During his career life, Mr. Ersan has gained his practical and field experience through his various significant positions and dedication as the **Policy**, **Organization & Manpower Development Head**, **Training & Development**, **Head**, **Ethylene Plant – Pyrolysis Furnace Engineer**, **Production Engineer**, Process Training Coordinator, Ethylene Plant Shift Supervisor, Ethylene Plant Panel & Fit Operator, Process Training & Development Coordinator, **Technical Consultant**, and **Instructor/Trainer** for Qatar Vinyl Company Limited and Qatar Petroleum Company (QAPCO).

Mr. Ersan is a **Registered Professional Engineer** and has a **Master's degree** of **Education** in **Educational Training & Leadership** and a **Bachelor's degree** of **Petrochemical Engineering**. Further, he is a **Certified Instructor/Trainer** and has delivered numerous trainings, courses, workshops, conferences and seminars internationally.

Course Fee

US$ 5,500 per Delegate + **VAT**. The 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.

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 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*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction to H.T. Process*** *Basis of Design of H.T. Unit ● Catalyst Type, Function & Deactivation*
0930 – 0945	*Break*
0945 – 1100	***Chemical Reactions, Process Variables Process & Temp.***
1100 – 1230	***Operating Variables, Hydrogen Ratio & LHSV.***
1230 – 1245	*Break*
1245 – 1420	***Gas Oil H.T. Unit*** *Start-up Guide Lines ● Discussion*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Naph. H.T. Unit*** *Start-up Guide Lines ● Emergency Procedure*
0830 – 0930	***Safety Rules Concerning H.T. Units.***
0930 – 0945	*Break*
0945 – 1100	***Discussions***
1100 – 1230	***Catalytic Reformer Unit*** *Introduction ● Chemical Reactions*

1230 – 1245	*Break*
1245 – 1420	***Reaction Mechanism*** *Feed preparation ● Discussion*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0800	***Polymerization of Olefins*** *Ziegler- Natta Polymerization Catalyst, Homogeneous and Heterogenous Catalyst ● Stereochemistry of Ziegler – Natta Polymerization ● Configuration of Polymers ● Metallocene Polymerization Catalyst ● Typical Properties of Metallocene System ● Mechanism of Metallocene Polymerization Reaction*
0800 - 0830	***Case Studies*** *Polypropylene Polymerization Plant ● Vinyl Chloride Plant*
0830 - 0900	***Operating Variables, Pressure & Temperature***
0900 – 0930	***Dehydrogenation***
0930 – 0945	*Break*
0945 – 1100	***Process Variables, Hydrogen Ratio, R\G ratio & LHSV***
1100 – 1230	***Process Control of Unit, Emergency Cases, Troubleshooting & Catalyst Deactivation***
1230 – 1245	*Break*
1245 – 1330	***Start-up Procedure***
1330 – 1420	***Discussion***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Shutdown Procedure***
0830 – 0930	***Cat. Regeneration Procedure***
0930 – 0945	*Break*
0945 – 1100	***Introduction to Hydro Cracking Unit*** *Chemical Reactions ● Reaction Mechanism*
1100 – 1230	***Process Variables, Pressure & Temperature***
1230 – 1245	*Break*
1245 – 1420	***Discussion***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0830	***Process Variables, Hydrogen/Hydrocarbon Ratio***
0830 – 0930	***Hydrogen Purity, L.H.S.V.***
0930 – 0945	*Break*
0945 – 1045	***Feed Preparation, Catalyst Deactivation, Catalyst Poisoning & Type of Catalyst***
1045 – 1130	***Start-up Procedure & Shutdown Procedure***
1130 – 1230	***Emergency Cases, Troubleshooting & Run-Away Temperature***
1230 – 1245	*Break*
1245 – 1345	***Discussion***
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-

Course Coordinator

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