

COURSE OVERVIEW PE0055

Reactors, Extruders and Extractors Operations for Operator

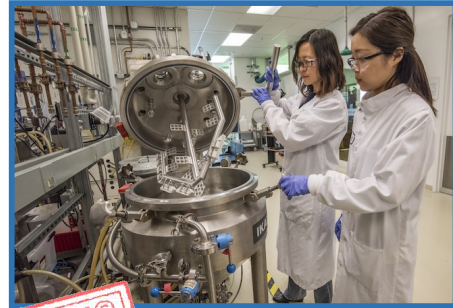
Course Title

Reactors, Extruders and Extractors Operations for Operator

Course Date/Venue

Session 1: June 29-July 03, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Session 2: November 24-28, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE



Course Reference

PE0055



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.



This course is designed to provide participants with a detailed and up-to-date overview of Chemical Reactors Design, Operation & Control. It covers the role and importance of chemical reactors in industry; the types of reactors and basic reactor design equations; the thermodynamics and kinetics in reactor design, heat and mass transfer in reactors and reactor sizing and scale-up principles; the types of catalysts and their impact on reactor design; the non-ideal flow patterns in reactors, multiphase reactor design and reactor modeling and simulation; the optimization techniques in reactor design; the safety considerations in reactor design; the startup and shutdown procedures and best practices monitoring; and the proper monitoring and control of reactor conditions.



During this interactive course, participants will learn to troubleshoot the common operational issues; the reactor maintenance and reliability, quality control in reactor operations and environmental and regulatory compliance; the reactor control systems, reactor control strategies, reactor safety and emergency control systems; the process optimization and efficiency by maximizing output while minimizing waste and energy use; integrating reactors with plant operations; the emerging technologies in reactor design; the green chemistry and sustainable reactor design; and the digitalization and smart reactors, future challenges and opportunities in reactor technology.

Course Objectives

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

- Apply and gain an in-depth knowledge on chemical reactors design, operation and control
- Discuss the role and importance of chemical reactors in industry and identify the types of reactors and basic reactor design equations
- Describe thermodynamics and kinetics in reactor design, heat and mass transfer in reactors and reactor sizing and scale-up principles
- Recognize the types of catalysts and their impact on reactor design
- Illustrate non-ideal flow patterns in reactors, multiphase reactor design and reactor modeling and simulation
- Carryout optimization techniques in reactor design as well as safety considerations in reactor design
- Apply startup and shutdown procedures and best practices including proper monitoring and control of reactor conditions
- Troubleshoot common operational issues and implement reactor maintenance and reliability, quality control in reactor operations and environmental and regulatory compliance
- Recognize reactor control systems, reactor control strategies, reactor safety and emergency control systems
- Implement process optimization and efficiency by maximizing output while minimizing waste and energy use
- Integrate reactors with plant operations and discuss emerging technologies in reactor design
- Discuss green chemistry and sustainable reactor design, digitalization and smart reactors, future challenges and opportunities in reactor technology

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 chemical reactors design, operation and control for process engineers, production engineers, section heads, shift supervisors and other operational staff.

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: -

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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.

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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. Saad Bedir (Saad Lofty Saad Saad), MSc, BSc, is a **Senior Chemical Engineer** with over **30 years** of extensive experience in the **Power, Petrochemical, Oil & Gas** and **Cement** industries. He is well-versed in the areas of Introduction to **Process Troubleshooting, Polyethylene Manufacturing & Process Troubleshooting, Polyethylene Flexible Packaging, Polyethylene Wire & Cable, Polymers, Polymers & Composites, Distillation Column Operation & Control, Polymers & Polymerization, Oil Movement Storage & Troubleshooting, Process**

Equipment Design, Applied Process Engineering Elements, Polymer & Materials Engineering, Polyethylene Processing Techniques, Advanced Polymer Chemistry, Plastics Technology, LLDPE Productions & Utilization, Process Plant Optimization, Plant Start-up & Shutdown Procedures using Aspen HYSYS Simulation, Heat & Power Consumption, Heat Transfer, Clean Energy & Power Saving, Fuel Handling System, Oil Movement & Operation, Oil Production, Gas Conditioning & Processing, Plastic Additives, Process Plant Performance & Efficiency, Plant Optimization and Process Operations. His expertise also includes the implementation of Environmental Impact Assessment (**EIA**), **OHSAS 18001, ISO 9001, ISO 14001, QHSE** Management Planning, Air Quality Management, Health, Fire, Safety, Security & Environmental Codes of Practice, Legislations and Procedures. Crisis & Business Continuity Management Planning, Emergency Response & Procedures, Industrial Security Risk Assessment & Management, , Behavioural Safety, Incident & Accident Investigation, Integrated EHS Aspects, Risk Assessment & Hazard Identification, Environmental Audits, Hazardous & Non-Hazardous Waste Management, Confined Space Safety, **SHEMS** Principles, Process Safety, Basic & Advanced Construction Safety, Rig & Barge Inspection, , Safety & Occupational Health Awareness, Loss Control, Lifting & Slings, Marine Pollution Hazards & Control, Ground Contamination & Reclamation Processes, Waste Management & Recycling, **HAZOP, HAZID, HSEIA, QRA**, Hazardous Area Classification, Radiation Protection, Active and Positive Fire Fighting, Fire & Gas Detection Systems, Fire Fighting Systems, Fire Proofing, ESD, Escape Routes. Presently, he is the **HSE Director** for one of the largest and renowned companies in the Middle East, wherein he takes charge of all HSE and security operations of the company.

Mr. Saad's vast professional experience in directing & managing process operations and health, safety and the environment aspects as per OSHA framework and guidelines can be traced back to his stint with a few international companies like **Saudi ARAMCO, CONOCO, Kuwait Oil Co. (KOC)**, etc, where he worked as the **Field Senior Process Consultant** handling major projects and activities related to the discipline. Through these, he gained much experience and knowledge in the implementation and maintenance of **internationally accepted principles** of process operations. Through this, he has also gained knowledge regarding international safety standards for the National Fire Protection Association (**NFPA**), the American Petroleum Institute (**API**), Safety of Life at Sea (**SOLAS**), and Safety for Mobile Offshore Drilling Unit (**MODU**).

Mr. Saad has a **Bachelor's** degree in **Chemistry** from the **Ain Shams University** and a **NEBOSH** certificate holder. Further, he is a **Certified Instructor/Trainer**, a **Certified Lead Auditor** for **OHSAS 18001, ISO 9001, ISO 14001** and a **member** of the **Egyptian Syndicate & Scientific Professions**. His passion for development and acquiring new skills and knowledge has taken him all over the Middle East to attend and share his expertise in numerous trainings and workshops.



Accommodation

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

Course Fee

US\$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Howard 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 workshop for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	<i>Registration & Coffee</i>
0800 – 0815	<i>Welcome & Introduction</i>
0815 – 0830	PRE-TEST
0830 – 0930	Introduction to Chemical Reactors in Industry: Overview of their Role & Importance
0930 – 0945	<i>Break</i>
0945 – 1030	Types of Reactors: Batch, Continuous, PFR, CSTR, etc.
1030 – 1130	Basic Reactor Design Equations: Understanding Material & Energy Balances
1130 – 1215	Thermodynamics & Kinetics in Reactor Design: Fundamentals & their Application
1215 – 1230	<i>Break</i>
1230 – 1330	Heat & Mass Transfer in Reactors: Principles & Considerations in Design
1330 – 1420	Reactor Sizing & Scale-Up Principles: Techniques & Challenges in Scaling Up Reactors
1420 – 1430	Recap
1430	<i>Lunch & End of Day One</i>

Day 2

0730 – 0830	Catalysis in Chemical Reactors: Types of Catalysts & their Impact on Reactor Design
0830 – 0930	Non-Ideal Flow Patterns in Reactors: Deviations from Ideal Behavior & their Implications
0930 – 0945	<i>Break</i>
0945 – 1100	Multiphase Reactor Design: Designing for Liquid-Liquid, Gas-Liquid & Solid-Liquid Systems
1100 – 1215	Reactor Modeling & Simulation: Tools & Techniques for Reactor Design Simulation
1215 – 1230	<i>Break</i>
1230 – 1330	Optimization Techniques in Reactor Design: Approaches to Optimize Reactor Performance
1330 – 1420	Safety Considerations in Reactor Design: Recognizing & Mitigating Potential Hazards
1420 – 1430	Recap
1430	<i>Lunch & End of Day Two</i>



Day 3

0730 – 0830	Startup & Shutdown Procedures: Best Practices for Starting & Stopping Reactors Safely
0830 – 0930	Monitoring & Control of Reactor Conditions: Temperature, Pressure & Flow Controls
0930 – 0945	Break
0945 – 1100	Troubleshooting Common Operational Issues: Identifying & Addressing Operational Problems
1100 – 1215	Reactor Maintenance & Reliability: Ensuring Ongoing Operational Efficiency
1215 – 1230	Break
1230 – 1330	Quality Control in Reactor Operations: Ensuring Product Quality & Consistency
1330 – 1420	Environmental & Regulatory Compliance: Adhering to Environmental Regulations & Standards
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4

0730 – 0830	Reactor Control Systems: Introduction to Control Theory & Applications
0830 – 0930	Reactor Control Strategies: PID Control, Cascade Control, Feedforward Control
0930 – 0945	Break
0945 – 1100	Reactor Safety & Emergency Control Systems: Implementing Safety Interlocks & Alarms
1100 – 1215	Process Optimization & Efficiency: Maximizing Output While Minimizing Waste & Energy Use
1215 – 1230	Break
1230 – 1330	Integration of Reactors with Plant Operations: Ensuring Smooth Operation within the Larger System
1330 – 1420	Case Studies of Reactor Control Challenges: Real-World Examples & Solutions
1420 – 1430	Recap
1430	Lunch & End of Day Four

Day 5

0730 – 0830	Emerging Technologies in Reactor Design: Latest Advancements in Reactor Technology
0830 – 0930	Green Chemistry & Sustainable Reactor Design: Eco-Friendly Approaches in Chemical Processing
0930 – 0945	Break
0945 – 1100	Digitalization & Smart Reactors: The Role of IoT, AI & Big Data in Reactor Operations
1100 – 1230	Future Challenges & Opportunities in Reactor Technology: Predicting Future Industry Needs

1230 - 1245	Break
1245 - 1345	Interactive Workshop: Problem-Solving & Design Exercises Based on Real Scenarios
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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