COURSE OVERVIEW PE0245
Oil and Gas-Water Three-Phase Separation Fundamentals

Course Title
Oil and Gas-Water Three-Phase Separation Fundamentals

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
PE0245

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

Course Description

This practical and highly-interactive course includes real-life case studies 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 separation process technology in the industry. It covers the separation process technology and its various roles and separating agents; the common steps in designing all separation process; and the process of distillation including its similar and alternative processes and the stages of equilibrium and its efficiency.

Further, the course will also discuss the absorption and stripping processes covering the operating lines for absorption, stripping analysis, column diameter, dilute multisolute absorbers, strippers, etc; the extraction process and the various types and features of extractors; the importance and role of leaching and washing methods in separation technology and the common equipments used in the processes; the concept of adsorption process and desorption method; and the theory of membrane processes including its design consideration and future uses.

During this interactive course, participants will learn the role of energy consumption in distillation; the concept and uses of the distillation and extraction; the strengths and weaknesses of distillation and other separation processes in the industry; the advantages and disadvantages of each separation process their features and specifications; and the step-by-step procedures for separation process selection for liquid and gas waste treatment applications.

Course Objectives

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

- Apply and gain a comprehensive knowledge on separation process technology in the industry
- Discuss the separation process technology and identify its various roles and separating agents
- Recognize the common steps in designing all separation processes
- Explain the process of distillation including its similar and alternative processes and the stages of equilibrium and its efficiency
- Identify absorption and stripping processes covering the operating lines for absorption, stripping analysis, column diameter, dilute multisolute absorbers, strippers, etc.
- Carryout extraction process and recognize the various types and features of extractors
- Identify the importance and role of leaching and washing methods in separation technology and list down the common equipments used in the following processes
- Distinguish the concept of adsorption process and desorption method
- Discuss the theory of membrane processes including its design considerations and future uses
- Determine the role of energy consumption in distillation and differentiate the concepts and uses of distillation and extraction
- Describe the strengths and weaknesses of distillation and other separation processes in the industry as well as the advantages and disadvantages of each separation process and their features and specifications
- Employ the step-by-step procedures for separation process selection for liquid and gas waste treatment applications

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 significant aspects and considerations of separation process technology in the industry for engineers, chemists, managers and other technical staff who will maximize profitability by optimizing performance of separation processes in the chemical, petrochemical, petroleum, pharmaceutical, food and paper industries.

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$ 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

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: -

- 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. Dimitry Rovas, CEng, MSc, PMI-PMP, is a **Senior Engineer** with extensive industrial experience in **Oil**, **Gas**, **Power** and **Utilities** industries. His expertise includes **Gas Conditioning & Processing**, **Process Plant** Optimization, Effective **Production Operations** in the Oil & Gas Fields, Advanced Process Safety Management (**PSM**), **Process Equipment** Design, Applied **Process** Engineering, **Oil Production & Processing** Facilities, Pr**ocess Plant Optimization & Rehabilitation**, **Process Plant** Troubleshooting & Engineering Problem Solving, **Operations Abnormalities & Plant Upset**, **Glass Reinforced Plastics**, **GRP Resins**, **Pipe Products & Applications**, **Pipe** System Designs & Installation, **Steel & Fiberglass** Construction, **GRP Linings** & Method Application, **Rubber Com**pounding, Elastomers, Thermoplastic, Industrial Rubber Products, Rubber Manufacturing Systems, **Heat Transfer**, **Vulcanization** Methods, **Energy Conservation**, **Energy Loss** Management in Electricity Distribution Systems, **Energy Saving**, **Thermal Power Plant** Management, **Thermal Power Plant** Operation & Maintenance, **Gas & Steam Turbines**, **Turbine Operations**, **Heat Transfer**, **Machine Design**, **Fluid Mechanics**, **Heating & Cooling Systems**, **Heat Insulation** Systems, **Heat Exchanger & Cooling Towers**, **Mechanical Erection**, **Heavy Rotating Equipment**, **HAZMAT & HAZCOM**, **Hazardous Materials & Chemicals MSDS**, Modern Heating, Ventilation, Air-Conditioning (**HVAC**) **& Refrigeration** Systems, Emergency **Air Compressors**, **Gas Turbine** Condition Monitoring & Fault Diagnosis, Modern **Valve** Technology, **Pumps & Valves**, Detailed Engineering Codes & Standards, **Hydraulic** System Overhaul & Troubleshooting, **Hydraulic** System Design & Troubleshooting, **Boiler** Maintenance & Inspection, **Pipe Stress** Analysis, Material Unloading & Storage, Commissioning & Start-Up. Further, he is also well-versed in MS project & AutoCAD, EPC Power Plant, Power Generation, Combined Cycle Powerplant, Leadership & Mentoring, Project Management, Strategic Planning/Analysis, Construction Management, Team Formation, Relationship Building, Communication, Reporting and Six Sigma. He was the **Project Manager** wherein he was managing, directing and controlling all activities and functions associated with the domestic heating/cooling facilities projects.

During his life career, Mr. Rovas has gained his practical and field experience through his various significant positions and dedication as the **EPC Project Manager**, **Field Engineer**, **Preventive Maintenance Engineer**, **Researcher**, **Instructor/Trainer**, **Telecom Consultant** and **Consultant** from various companies such as the Podaras Engineering Studies, Metka and Diadikasia, S.A., **Hellenic Petroleum Oil Refinery** and COSMOTE.

Mr. Rovas is a **Chartered Engineer** of the **Technical Chamber** of **Greece**. Further, he has **Master** degrees in **Mechanical Engineering** and **Energy Production & Management** from the **National Technical University of Athens**. Moreover, he is a **Certified Instructor/Trainer**, a **Certified Project Management Professional** (**PMP**), a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**) and a **Certified Six Sigma Black Belt**. He is an active member of Project Management Institute (**PMI**), Technical Chamber of Greece and Body of Certified Energy Auditors and has further delivered numerous trainings, seminars, courses, workshops and conferences internationally.

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 - 0945	***Introduction*** *Roles of Separation Processes in Industry ● Separating Agents ● Technological Maturity of Processes • Efficiency versus Capacity ● Emergence of the Monolith as a Contacting Device ● Steps Common to Designing All Separation Processes*
0945 - 1000	*Break*
1000 - 1130	***Distillation*** *Equilibrium ● Equilibrium Stages ● Efficiency ● Trays • Packings*
1130 – 1230	***Distillation (cont'd)*** *Trays versus Packings ● Membrane Phase Contractors ● Design Procedures ● Rate-Based Design Method*
1230 – 1245	*Break*
1245 - 1420	***Distillation (cont'd)*** *Alternative Distillation Processes ● Processes Similar to Distillation ● Enhanced Distillation Configurations ● Hybrid Systems ● Distillation Economics*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0900	***Absorption & Stripping*** *Absorption and Stripping Equilibria ● Operating Lines for Absorption ● Stripping Analysis ● Column Diameter*
0900 – 0915	*Break*
0915 – 1100	***Absorption & Stripping (cont'd)*** *Analytical Solution: Kremser Equation ● Dilute Multisolute Absorbers and Strippers ● Matrix Solution for Concentrated Absorbers and Strippers ● Irreversible Absorption*
1100 – 1230	***Extraction*** *Liquid/Liquid Extraction ● Supercritical Fluid Extraction ● Liquid/Liquid Equilibria ● Equilibrium Stage Calculations ● Efficiency*
1230 - 1245	*Break*
1245 – 1420	***Extraction (cont'd)*** *Solvent Selection ● Extraction Equipment ● Simple Extractors ● Mechanical Extractors ● Extractor Costs*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0900	***Leaching & Washing*** *Instructional Objectives ● Equipment for Leaching*
0900 – 0915	*Break*
0915 – 1100	***Leaching & Washing (cont'd)*** *Equilibrium-Stage Model for Leaching & Washing ● Rate-Based Model for Leaching*
1100 – 1230	***Adsorption*** *Adsorption & Desorption ● Adsorbents*
1230 – 1245	*Break*
1245 – 1420	***Adsorption (cont'd)*** *Design Considerations ● Adsorption Processes*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 - 0900	***Membrane Processes*** *Theory ● Membranes & Modules ● Design Considerations*
0900 - 0915	*Break*
0915 - 1100	***Membrane Processes (cont'd)*** *Some Current Uses ● Future Uses for Membranes*
1100 – 1230	***Crystallization, Desublimation & Evaporation*** *Instructional Objectives ● Crystal Geometry ● Thermodynamic Considerations ● Kinetic & Transport Considerations ● Equipment for Solution Crystallization ● The MSMPR Crystallization Model*
1230 – 1245	*Break*
1245 – 1420	***Crystallization, Desublimation & Evaporation (cont'd)*** *Precipitation ● Melt Crystallization ● Zone Melting ● Desublimation ● Evaporation*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 - 0900	***Energy Considerations*** *Energy Consumption in Distillation ● Energy Consumption-Distillation versus Extraction ● Maximum Thermodynamic Efficiency*
0900 - 0915	*Break*
0915 - 1100	***Process Selection*** *Strengths & Weaknesses of Distillation & Other ● Vapor-Liquid Separation Processes*
1100 – 1230	***Process Selection (cont'd)*** *Pluses & Minuses of Alternative Processes ● Separation of Complex Mixtures and Heuristic Guidelines for Process Selection*
1230 – 1245	*Break*
1245 - 1345	***Process Selection (cont'd)*** *Procedures for Process Selection ● Process Selection for Liquid & Gas Waste Treatment Applications*
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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