COURSE OVERVIEW DE0541
Production Chemistry

Course Title
Production Chemistry

Course Date/Venue
Session 1: May 18-22, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
Session 2: September 29-October 03, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
DE0541

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 Production Chemistry. It covers the role of production chemistry in oil and gas industry; the impact of chemical reactions on production efficiency; the composition and properties of produced fluids including the phase behavior and thermodynamics in production chemistry; the water chemistry in oil and gas production; the common chemical reactions in production systems; and the scale formation, deposition and corrosion and its impact on production assets.

Further, the course will also discuss the scale deposition and prevention techniques; the corrosion mechanisms in oilfield systems; the wax and asphaltene deposition in pipelines, hydrate formation and inhibition and emulsions in oil and gas production; the chemical injection strategies in production systems, gas treatment and processing chemistry; the crude oil dehydration and desalting; the enhanced oil recovery (EOR) chemistry; and the chemical compatibility testing and laboratory analysis.

During this interactive course, participants will learn the procurement and storage of production chemicals, transportation and handling of hazardous chemicals; the regulatory compliance in chemical management; the environmental impact of production chemicals, produced water treatment and reuse as well as green chemistry and sustainable production chemistry; the waste management, chemical disposal and commitment to net-zero and carbon reduction; the role of AI and machine learning in chemical management; and the smart sensors for real-time chemical monitoring.

Course Objectives

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

- Apply and gain a good working knowledge on production chemistry
- Discuss the role of production chemistry in oil and gas industry and the impact of chemical reactions on production efficiency
- Identify the composition and properties of produced fluids including the phase behavior and thermodynamics in production chemistry
- Recognize water chemistry in oil and gas production as well as the common chemical reactions in production systems
- Interpret scale formation, deposition and corrosion and its impact on production assets
- Carryout scale deposition and prevention techniques and corrosion mechanisms in oilfield systems
- Determine wax and asphaltene deposition in pipelines, hydrate formation and inhibition and emulsions in oil and gas production
- Apply chemical injection strategies in production systems and gas treatment and processing chemistry
- Illustrate crude oil dehydration and desalting and discuss enhanced oil recovery (EOR) chemistry
- Employ chemical compatibility testing and laboratory analysis
- Carryout procurement and storage of production chemicals, transportation and handling of hazardous chemicals and regulatory compliance in chemical management
- Discuss environmental impact of production chemicals, produced water treatment and reuse as well as green chemistry and sustainable production chemistry
- Apply waste management, chemical disposal and commitment to net-zero and carbon reduction
- Define the role of AI and machine learning in chemical management as well as apply smart sensors for real-time chemical monitoring

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 production chemistry for production technicians, process operators, researchers in chemical or process engineering, maintenance personnel in chemical plants, quality control and assurance professionals.

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. Shehab Al-Hamoud, MSc, BSc, is a **Senior Petroleum Engineer** with over **25 years** of **offshore** and **onshore** experience in the **Oil** & **Gas**, **Refinery** & **Petrochemical** industries. His wide expertise includes **Advanced Production Logging**, **Well Testing & Software** Application, **Wellhead & X-mass Tree**, **Completion Design**, **Well Integrity**, **Drilling & Workover** Operations, **Completion** Design & Fishing, **Well Control**, **Stuck Pipe** Principle & Practical, **Advanced Coiled Tubing** Operations & Fishing, **Rigless Solutions**, **Advanced Wire Line & Fishing**, **Well Completion Design & Performance** for Production Engineering, **SCSSV** Problems, **Well Testing** Operations, Well Intervention (**IWCFR**), **Workovers & Completions**, **Petroleum Risk & Decision** Analysis, **Well Testing** Analysis, **Engineering & Simulation**, **Reservoir Monitoring**, **Artificial Lift Design**, **Gas Operations**, **Oil & Gas Production**, **Well Cementing**, **Production Optimization**, **Production Logging** and **Project Evaluation** & **Economic Analysis**. He is currently the **Well Service & Field Operations Engineer/Supervisor** wherein he is in-charge of rigless package operations, kill well, coiled tubing operations, acidizing and fracturing, slick line operations, well completion and exploratory well testing operations, safety and emergency exercises on site.

During his career life, Mr. Shehab has gained his practical and field experience through his various significant positions and dedication as the **Field Operations Engineer**, **Well Services Engineer**, **Completion & Well Service Supervisor**, **Rigless Package Supervisor**, **Completion & Workover Supervisor**, **Completion & Workover Supervisor, Well Site Supervisor** and **Senior Technical Train/Lecturer** from various international companies such as the AFPC, ADCO and SPC just to name a few.

Mr. Shehab has a **Bachelor's** degree in **Petroleum Engineering**. Further, he is a **Certified Instructor/Trainer** a **Certified Petroleum Engineer**, held certificates on **IADC/ IWCF Well Control** and **H2S Training** and has delivered numerous trainings, courses, seminars, workshops and conferences internationally.

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$ 8,000 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 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 – 0900	***Introduction to Production Chemistry*** *Role of Production Chemistry in Oil and Gas Industry • Impact of Chemical Reactions on Production Efficiency • Approach to Production Chemistry • Case Studies on Production Chemistry Challenges*
0900 - 0930	***Composition & Properties of Produced Fluids*** *Crude Oil Composition and Classification • Natural Gas Components and Properties • Water Chemistry in Production Systems • Formation and Handling of Emulsions*
0930 – 0945	*Break*
0945 - 1130	***Phase Behavior & Thermodynamics in Production Chemistry*** *Understanding Phase Diagrams and PVT Analysis • Gas-Liquid Equilibrium and Its Impact on Production • Wax and Asphaltene Precipitation in Hydrocarbons • Impact of Temperature and Pressure on Fluid Behavior*
1130 – 1230	***Water Chemistry in Oil & Gas Production*** *Composition of Formation and Produced Water • Water pH, Scaling, and Corrosion Issues • Water Treatment Techniques in Oil and Gas Production • Produced Water Management Strategies*
1230 – 1245	*Break*
1245 – 1330	***Common Chemical Reactions in Production Systems*** *Hydrocarbon Oxidation and Degradation • Sulfide and Carbonate Reactions in Reservoirs • Acid-Base Interactions in Oilfield Fluids • Monitoring and Control of Chemical Reactions*
1330 – 1420	***Production Chemistry Challenges & Solutions*** *Scale Formation and Deposition • Corrosion and Its Impact on Production Assets • Wax and Asphaltene Problems in Pipelines • Strategies for Production Chemistry Optimization*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2

0730 – 0800	***Scale Deposition & Prevention Techniques*** *Causes of Scale Deposition in Oil Wells and Pipelines • Common Types of Scales (Calcium Carbonate, Barium Sulfate, Iron Sulfide) • Chemical Scale Inhibitors and Their Mechanisms • Scale Management and Prevention Strategies*
0800 - 0930	***Corrosion Mechanisms in Oilfield Systems*** *Types of Corrosion (CO_2 Corrosion, H_2S Corrosion, Microbial Corrosion) • Electrochemical Reactions in Corrosion Processes • Corrosion Inhibitors and Coatings • Corrosion Prevention and Monitoring Programs*
0930 – 0945	*Break*
0945 – 1100	***Wax & Asphaltene Deposition in Pipelines*** *Chemical Composition and Formation Mechanisms • Impact on Flow Assurance and Pipeline Integrity • Wax Dispersants and Asphaltene Inhibitors • Pipeline Wax and Asphaltene Management Techniques*
1100 – 1230	***Hydrate Formation & Inhibition*** *Mechanisms of Gas Hydrate Formation in Pipelines • Hydrate Inhibitors (Thermodynamic and Kinetic Inhibitors) • Role of Dehydration in Hydrate Prevention • Strategies for Hydrate Risk Mitigation*
1230 – 1245	*Break*
1230 – 1330	***Emulsions in Oil & Gas Production*** *Formation of Water-in-Oil and Oil-in-Water Emulsions • Stability and Breakdown Mechanisms of Emulsions • Demulsification Techniques and Chemical Additives • Emulsion Treatment and Separation Technologies*
1330 - 1420	***Case Study: Flow Assurance & Chemical Management*** *Overview of Flow Assurance • Chemical Injection and Monitoring Programs • Success Stories in Scale, Corrosion, and Wax Management • Future Challenges and Mitigation Strategies*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3

0730 – 0800	***Chemical Injection Strategies in Production Systems*** *Types of Production Chemicals and Their Functions • Chemical Injection Points and Monitoring Methods • Compatibility of Production Chemicals with Reservoir Fluids • Best Practices in Chemical Injection*
0800 - 0930	***Gas Treatment & Processing Chemistry*** *Removal of H_2S and CO_2 From Natural Gas • Use of Amines and Absorption Processes • Impact of Gas Processing Chemistry on LNG Production • Gas Sweetening and Treatment Technologies*
0930 – 0945	*Break*
0945 – 1100	***Crude Oil Dehydration & Desalting*** *Need for Water and Salt Removal from Crude Oil • Electrostatic Desalters and Chemical Demulsifiers • Impact of Salt Content on Refining Processes • Approach to Crude Oil Quality Improvement*
1100 – 1230	***Enhanced Oil Recovery (EOR) Chemistry*** *Polymer Flooding and Surfactant-Polymer Flooding • Alkaline Flooding and Its Role in Oil Mobilization • CO_2 Injection and Miscible Gas Flooding • EOR Initiatives and Chemical Innovations*

1230 – 1245	*Break*
1230 – 1420	***Chemical Compatibility Testing & Laboratory Analysis*** *Importance of Chemical Compatibility Studies • Standard Laboratory Tests for Chemical Screening • Laboratory Capabilities in Production Chemistry • Data Interpretation and Decision-Making in Chemical Selection*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4

0730 – 0930	***Chemical Supply Chain and Logistics*** *Procurement and Storage of Production Chemicals • Transportation and Handling of Hazardous Chemicals • Regulatory Compliance in Chemical Management • Chemical Inventory Optimization Strategies*
0930 – 0945	*Break*
0945 – 1100	***Environmental Impact of Production Chemicals*** *Effects of Production Chemicals on Marine and Soil Ecosystems • Regulations on Chemical Discharge and Disposal • Environmental Protection Initiatives • Case Study: Sustainable Chemical Management*
1100 – 1230	***Produced Water Treatment & Reuse*** *Chemical and Physical Properties of Produced Water • Technologies for Removing Oil, Solids, and Salts • Chemical Treatment versus Membrane Filtration Methods • Water Recycling and Disposal Strategies*
1230 – 1245	*Break*
1230 – 1330	***Green Chemistry & Sustainable Production Chemistry*** *Principles of Green Chemistry in Oilfield Operations • Development of Eco-Friendly Production Chemicals • Reducing Chemical Consumption Through Process Optimization • Sustainability Roadmap in Chemical Applications*
1330 - 1420	***Waste Management & Chemical Disposal*** *Handling of Chemical Waste in Oil and Gas Operations • Compliance with Environmental Laws • Recycling and Reuse of Production Chemicals • Case Study: Best Practices in Chemical Waste Management*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

Day 5

0730 – 0830	***Commitment to Net-Zero & Carbon Reduction*** *Role of Production Chemistry in Emission Reduction • Carbon Capture and Storage (CCS) Technologies • Chemical Innovations for Energy Efficiency • Decarbonization Strategy*
0830 - 0930	***Workshop: Sustainable Chemical Solutions*** *Identifying Key Sustainability Challenges • Group Discussion on Green Chemistry Innovations • Developing a Chemical Optimization Plan • Presentation of Findings and Recommendations*
0930 – 0945	*Break*

0945 – 1230	***Case Study: Production Chemistry Challenges & Solutions*** *Overview of Production Challenges • Strategies for Optimization and Chemical Application • Lessons Learned and Future Improvements • Interactive Discussion and Knowledge Sharing*
1230 – 1245	*Break*
1245 – 1345	***Advanced Technologies in Production Chemistry*** *Role of AI and Machine Learning in Chemical Management • Smart Sensors for Real-Time Chemical Monitoring • Investment in Digital Oilfield Technologies • Future Trends in Chemical Process Automation*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*End of Course*

Practical Sessions

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

Course Coordinator

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