# COURSE OVERVIEW DE0437
# Well Design & Engineering

**Course Title**
Well Design & Engineering


**Course Date/Venue**
Session 1: January 12-16, 2025/Meeting Plus 8, City Centre Rotana Doha Hotel, Doha, Qatar
Session 2: July 13-17, 2025/Meeting Plus 8, City Centre Rotana Doha Hotel, Doha, Qatar

3.0 CEUs (30 PDHs) AWARD

**Course Reference**
DE0437

**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 Well Design and Engineering. It covers the basics of petroleum geology, reservoir engineering fundamentals, drilling fluids and hydraulics; the wellbore trajectories, directional drilling basics and the importance of trajectory in well design; the types of drilling rigs, components and the selection process for a well project; and the casing design and selection as well as cementing and zonal isolation.

Further, the course will also discuss the components and selection criteria for wellheads and Christmas trees; the types, selection criteria and performance optimization of drill bits; the well control, blowout preventer systems, emergency response and planning and cost estimation; the advanced techniques in directional drilling including tools and software applications; the common drilling problems such as stuck pipe and loss of circulation; and the high-pressure high-temperature (HPHT) wells including underbalanced and managed pressure drilling.

During this interactive course, participants will learn the technologies and applications of logging while drilling (LWD) and measurement while drilling (MWD) in real-time decision-making; the completion design and operations, hydraulic fracturing, acidizing and other stimulation methods to enhance production; the sand control, techniques and applications including artificial lift systems and production logging and monitoring; the workover operations, intervention techniques and tools; the project management in well design and engineering; the health, safety, and environmental (HSE) considerations; the QA/QC in well design, material selection and execution phases; the role of digitalization, big data and AI in optimizing well design and operations; the sustainability and environmental impact reduction; and the strategies for reducing environmental impact in well design and operation.

## Course Objectives

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

- Apply and gain an in-depth knowledge on well design and engineering
- Discuss the basics of petroleum geology, reservoir engineering fundamentals, drilling fluids and hydraulics
- Interpret wellbore trajectories, directional drilling basics and the importance of trajectory in well design
- Identify the types of drilling rigs, components and the selection process for a well project
- Carryout casing design and selection as well as cementing and zonal isolation
- Recognize the components and selection criteria for wellheads and Christmas trees
- Identify the types, selection criteria and performance optimization of drill bits
- Employ well control, blowout preventer systems and emergency response as well as well planning and cost estimation
- Apply advanced techniques in directional drilling including tools and software applications
- Identify and address the common drilling problems such as stuck pipe and loss of circulation
- Discuss high-pressure high-temperature (HPHT) wells including underbalanced and managed pressure drilling
- Explain the technologies and applications of logging while drilling (LWD) and measurement while drilling (MWD) in real-time decision-making
- Carryout completion design and operations as well as hydraulic fracturing, acidizing and other stimulation methods to enhance production
- Apply sand control, techniques and applications including artificial lift systems and production logging and monitoring
- Plan and execute workover operations, intervention techniques and tools
- Implement project management in well design and engineering and discuss health, safety, and environmental (HSE) considerations
- Implement QA/QC in well design, material selection and execution phases

- Discuss the role of digitalization, big data and AI in optimizing well design and operations
- Apply sustainability and environmental impact reduction and the strategies for reducing environmental impact in well design and operation

## 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 well design and engineering for petroleum engineers, reservoir engineers, reservoir technical assistants and other technical 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 Fee

**US$ 8,500** per Delegate. 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 **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.

- 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:

**Dr. Steve Ehrenberg** (**Stephen Neville Ehrenberg**), PhD, MSc, BSc, is a **Senior Geologist & Reservoir Engineer** with **45 years** of extensive experience within the **Oil** & **Gas**, **Petrochemical** and **Refinery** industries. His wide experience covers in the areas of **Core** & **Log Integration**, **Water Saturation**, **Coring** & **Core Analysis**, **Special Core Analysis**, **Log** Interpretation, Cased-Hole Logging, **Core Calibration**, **Core Analysis**, Core-to-Log Data Integration (**SCAL**), **Wireline** Logging, **Mud** Logging, **Cased Hole** Logging, **Production** Logging, **Well Logging**, **Reservoir** Management, **Reservoir** Appraisal & Development, **Carbonate Reservoir** Management, **Fractured Reservoirs** Evaluation & Management, **Naturally Fractured Reservoir**, Integrated **Carbonate Reservoir** Characterization, **Geological Modelling**, **Reservoir Characterization**, **Geomodelling**, Development **Geology**, **Petroleum Geology**, **Exploration Production**, **Structural Geology**, **Wellsite Geology**, Analytic Modelling Methods, **Sedimentary Geology**, **Geophysics**, **Geophysical Exploration**, **Reservoir** Engineering, **Reservoir** Engineering Applications, **Reservoir** Engineering & Stimulation, **Reservoir** Characterization, **Clastic Reservoir**, **Carbonate Reservoir Petrology**, Subsurface Facies Analysis, **Borehole Images, Geophysical Methods**, **Oil & Gas Exploration**, **Marine & Petroleum Geology**, **Reservoir Performance** Using Classical Methods, **Fractured Reservoir** Evaluation & Management, **Reservoir** Surveillance & Management, **Reservoir Monitoring**, , **Reservoir Volumetrics**, **Water Drive Reservoir**, **Reservoir Evaluation**, **Well Surveillance**, **Well Testing**, **Well Testing** & Oil Well Performance, Well Log Interpretation (**WLI**), Rock Physics & Seismic Data, **Formation Evaluation**, **Well Testing** & Data Interpretation, **Pore Pressure** Prediction and **Oil & Gas Reserves Estimations**, Well Workover Supervision, Description and Prediction of **Reservoir Quality**, **Sequence Stratigraphy** of Carbonate Systems and Introductory Geology.

During his career life, Dr. Ehrenberg held significant positions and dedication as **Consultant**, **Professor**, **Senior Reservoir Geologist**, **Senior Geologist**, **Research Geologist**, **Associate Professor**, **Assistant Professor** and **Senior Instructor/Trainer** from various international companies and universities such as the Badley Ashton & Associates Ltd., Khalifa University of Science and Technology, Sultan Qaboos University, PanTerra Geoconsultants B.V, UAE University, Statoil, Stavanger, Shell Development Company and Northern Illinois University.

Dr. Ehrenberg has a **PhD**, **Master's** and **Bachelor's** degree in **Geology** from the **University of California**, **USA** and **Occidental College**, **USA**, respectively. Further, he is a **Certified Trainer/Assessor/Internal Verifier** by the **Institute of Leadership & Management** (**ILM**), a **Certified Instructor/Trainer** and has delivered numerous trainings, workshops, courses, seminars 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 workshop for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

***Day 1***

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| *0730 – 0800* | *Registration & Coffee* |
| *0800 – 0815* | *Welcome & Introduction* |
| *0815 – 0830* | ***PRE-TEST*** |
| *0830 – 0930* | ***Overview of Well Design & Engineering:*** *Introduction to the Course, Objectives & the Importance of Well Design in the Oil & Gas Industry* |
| *0930 – 0945* | *Break* |
| *0945 – 1030* | ***Petroleum Geology Basics:*** *Understanding Rock Types, Petroleum Reservoir Characteristics & the Significance of Geological Formations* |
| *1030 – 1130* | ***Reservoir Engineering Fundamentals:*** *Introduction to Reservoir Properties, Fluid Flow & the Role of Reservoir Engineering in Well Design* |
| *1130 – 1215* | ***Drilling Fluids & Hydraulics:*** *Types of Drilling Fluids, Functions, Selection Criteria & Hydraulics Modeling* |
| *1215 – 1230* | *Break* |
| *1230 – 1330* | ***Wellbore Trajectories:*** *Understanding Wellbore Trajectories, Directional Drilling Basics & the Importance of Trajectory in Well Design* |
| *1330 – 1420* | ***Rig Types & Components:*** *Overview of Drilling Rigs, Components & the Selection Process for a Well Project* |
| *1420 – 1430* | ***Recap*** |
| *1430* | *Lunch & End of Day One* |

***Day 2***

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|---|---|
| *0730 – 0830* | ***Casing Design & Selection:*** *Types of Casing, Casing Design Principles & Load Cases* |
| *0830 – 0930* | ***Cementing & Zonal Isolation:*** *Cement Types, Properties & the Process of Achieving Zonal Isolation* |
| *0930 – 0945* | *Break* |
| *0945 – 1100* | ***Wellhead & Christmas Tree Design:*** *The Components & Selection Criteria for Wellheads & Christmas Trees* |
| *1100 – 1215* | ***Drill Bit Selection & Performance:*** *Types of Drill Bits, Selection Criteria, & Performance Optimization* |
| *1215 – 1230* | *Break* |
| *1230 – 1330* | ***Well Control & Blowout Prevention:*** *Principles of Well Control, Blowout Preventer Systems & Emergency Response* |
| *1330 – 1420* | ***Well Planning & Cost Estimation:*** *Steps in Well Planning, Cost Control & Economic Evaluation* |
| *1420 – 1430* | ***Recap*** |
| *1430* | *Lunch & End of Day Two* |

***Day 3***

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| *0730 – 0830* | ***Directional Drilling Techniques:*** *Advanced Techniques in Directional Drilling, including Tools & Software Applications* |
| *0830 – 0930* | ***Hole Problems & Solutions:*** *Identifying & Addressing Common Drilling Problems, such as Stuck Pipe & Loss of Circulation* |
| *0930 – 0945* | *Break* |
| *0945 – 1100* | ***High-Pressure High-Temperature (HPHT) Wells:*** *Design & Operational Challenges in HPHT Environments* |

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|---|---|
| *1100 – 1215* | ***Underbalanced & Managed Pressure Drilling:*** *Concepts, Advantages & Applications* |
| *1215 – 1230* | *Break* |
| *1230 – 1330* | ***Logging While Drilling (LWD) & Measurement While Drilling (MWD):*** *Technologies & Applications in Real-Time Decision-Making* |
| *1330 – 1420* | ***Case Study:*** *Drilling Operation Analysis: Review of a Real-World Drilling Operation, Focusing on Challenges & Solutions* |
| *1420 – 1430* | ***Recap*** |
| *1430* | *Lunch & End of Day Three* |

***Day 4***

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| *0730 – 0830* | ***Completion Design & Operations:*** *Types of Completions, Design Criteria, & Operational Considerations* |
| *0830 – 0930* | ***Stimulation Techniques:*** *Hydraulic Fracturing, Acidizing & other Stimulation Methods to Enhance Production* |
| *0930 – 0945* | *Break* |
| *0945 – 1100* | ***Sand Control Solutions:*** *Understanding the Need for Sand Control, Techniques & Applications* |
| *1100 – 1215* | ***Artificial Lift Systems:*** *Types of Artificial Lift, Selection Criteria & Design Considerations* |
| *1215 – 1230* | *Break* |
| *1230 – 1330* | ***Production Logging & Monitoring:*** *Tools & Techniques for Monitoring Well & Reservoir Performance* |
| *1330 – 1420* | ***Workover & Intervention Strategies:*** *Planning & Executing Workover Operations, Intervention Techniques & Tools* |
| *1420 – 1430* | ***Recap*** |
| *1430* | *Lunch & End of Day Four* |

***Day 5***

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|---|---|
| *0730 – 0830* | ***Project Management in Well Design & Engineering:*** *Principles of Project Management, Team Roles & Project Execution Strategies* |
| *0830 – 0930* | ***Health, Safety & Environmental (HSE) Considerations:*** *HSE Management Systems, Risk Assessment & Mitigation in Well Design & Operations* |
| *0930 – 0945* | *Break* |
| *0945 – 1100* | ***Quality Assurance & Quality Control (QA/QC):*** *QA/QC in Well Design, Material Selection & Execution Phases* |
| *1100 – 1230* | ***Digital Technologies in Well Engineering:*** *The Role of Digitalization, Big Data & AI in Optimizing Well Design & Operations* |
| *1230 – 1245* | *Break* |
| *1245 – 1345* | ***Sustainability & Environmental Impact Reduction:*** *Strategies for Reducing Environmental Impact in Well Design & Operation* |
| *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**

Reem Dergham, Tel: +974 4423 1327, Email: reem@haward.org