

COURSE OVERVIEW DE0379
Fracturing of Vertical & Horizontal Wells

Course Title

Fracturing of Vertical & Horizontal Wells

Course Reference

DE0379

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs

Course Date/Venue

Session(s)	Date	Venue
1	April 21-25, 2024	Oryx Meeting Room, DoubleTree By Hilton Doha-Al Sadd, Doha, Qatar
2	September 15-19, 2024	
3	November 10-14, 2024	



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 Fracturing of Vertical & Horizontal Wells. It covers the principles of hydraulic fracturing and the basic concepts of rock mechanics and fracture mechanics; the types, properties and selection criteria of fracturing fluids and proppants; the fracture geometry and propagation; the design consideration for vertical wells and environmental and safety considerations; the fracture design and the treatment optimization; and the modeling tools and methodologies of numerical simulation of fractures.



Further, the course will also discuss the interpretation of pressure and rate transient analysis in fractured wells; the data acquisition and monitoring techniques; the unique aspects of fracturing horizontal wells including multi-stage fracturing in horizontal wells; and the completion techniques for horizontal wells, well spacing and fracture interference and production analysis post-fracturing.

During this interactive course, participants will learn the high-volume fracturing and zipper fractures; the re-fracturing techniques and integration of fracturing with reservoir simulation; the new developments in fracturing fluids and proppant technology; managing flowback and produced water; the challenges in deep and tight formations and best practices in fracturing operations; the economic evaluation of fracturing projects; the hydraulic fracturing regulations and public perception; and the future trends in hydraulic fracturing.

Course Objectives

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

- Apply and gain an in-depth knowledge on fracturing of vertical and horizontal wells
- Discuss the principles of hydraulic fracturing and the basic concepts of rock mechanics and fracture mechanics
- Identify the types, properties and selection criteria of fracturing fluids and proppants
- Determine fracture geometry and propagation, design considerations for vertical wells and environmental and safety considerations
- Apply fracture design and treatment optimization and recognize the modeling tools and methodologies of numerical simulation of fractures
- Interpret pressure and rate transient analysis in fractured wells and carryout data acquisition and monitoring techniques
- Describe the unique aspects of fracturing horizontal wells including multi-stage fracturing in horizontal wells
- Illustrate completion techniques for horizontal wells, well spacing and fracture interference and production analysis post-fracturing
- Discuss high-volume fracturing and zipper fractures and apply re-fracturing techniques and integration of fracturing with reservoir simulation
- Recognize the new developments in fracturing fluids and proppant technology and manage flowback and produced water
- Discuss challenges in deep and tight formations and apply best practices in fracturing operations
- Carryout economic evaluation of fracturing projects as well as explain hydraulic fracturing regulations and public perception including the future trends in hydraulic fracturing

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 fracturing of vertical and horizontal wells for petroleum engineers, geologist, reservoir engineers, drilling engineers, geoscientists, oil and gas industry professionals, drillers, environmental and safety experts and those who have a background or involved in the planning, execution and monitoring of fracturing of wells and want to advance their skills and knowledge in fracturing of vertical horizontal wells.

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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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.

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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.

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. Chris Kapetan, PhD, MSc, is a **Senior Drilling & Petroleum Engineer** with **40 years** of international experience within the **onshore and offshore oil & gas** industry. His wide experience covers **Cased Hole Logging** Interpretation, **Cased Hole Formation** Evaluation, **Cased Hole Applications**, **Data Acquisition** in **Cased-hole Logging**, **Drill String Design & Drilling** Optimization, **Drill String Design** Calculations, **Enhanced Oil Recovery (EOR)**, **Improved Oil Recovery (IOR)**, **Performance Analysis**, **Prediction**, and **Optimization Using NODAL Analysis**, **Stuck Pipe Prevention**, **Stuck Piping & Fishing** Operation, **Fishing** Operations, **Fishing** Techniques, **Fishing** Methodologies, **Wireline Fishing** Procedures, **Wireline & Coil Tubing**, **Coiled Tubing Fishing** Operation, **Coiled Tubing Technology**, **Fishing** Options in **Horizontal Wells**, **Horizontal & Multilateral Wells**, **Well Completion & Stimulation**, **Artificial Lift System Selection & Design**, **Drilling Practices**, **Drilling Fluids Technology**, **Drilling** Operations, **Simulation Program for The International Petroleum Business**, **International Oil Supply**, **Transportation**, **Refining & Trading**, **Control Well-Flow Lines Parameters**, **Decision Analytic Modelling Methods for Economic Evaluation**, **Probabilistic Risk Analysis (Monte Carlo Simulator)** **Risk Analysis Foundations**, **Global Oil Demand**, **Crude Oil Market**, **Global Oil Reserves**, **Oil Supply & Demand**, **Governmental Legislation**, **Contractual Agreements**, **Financial Modeling**, **Oil Contracts**, **Project Risk Analysis**, **Feasibility Analysis** Techniques, **Capital Operational Costs**, **Oil & Gas Exploration Methods**, **Reservoir Evaluation**, **Extraction of Oil & Gas**, **Crude Oil Types & Specifications**, **Sulphur**, **Sour Natural Gas**, **Natural Gas Sweetening**, **Petroleum Production**, **Field Layout**, **Production** Techniques & **Control**, **Surface Production** Operations, **Oil Processing**, **Oil Transportation-Methods**, **Flow metering & Custody Transfer** and **Oil Refinery**. Further, he is also well-versed in **Enhanced Oil Recovery (EOR)**, **Electrical Submersible Pumps (ESP)**, **Oil Industries Orientation**, **Geophysics**, **Production Operations**, **Production Management**, **Perforating Methods & Design**, **Perforating Operations**, **Fishing** Operations, **Well & Reservoir Testing**, **Reservoir Stimulation**, **Hydraulic Fracturing**, **Carbonate Acidizing**, **Sandstone Acidizing**, **Petroleum Business**, **Petroleum Economics**, **Field Development Planning**, **Gas Lift Valve** Changing & **Installation**, **Well Completion Design & Operation**, **Well Surveillance**, **Well Testing**, **Well Stimulation & Control** and **Workover Planning**, **Completions & Workover**, **Rig Sizing**, **Hole Cleaning & Logging**, **Well Completion**, **Servicing** and **Work-Over Operations**, **Practical Reservoir Engineering**, **X-mas Tree & Wellhead** Operations, **Advanced Petrophysics/Interpretation of Well Composite**, **Construction Integrity & Completion**, **Corrosion Control**, **Slickline**, **Pipeline Pigging**, **Corrosion Monitoring**, **Cathodic Protection** as well as **Root Cause Analysis (RCA)**, **Root Cause Failure Analysis (RCFA)**, **Gas Conditioning & Process Technology**, **Production Safety** and **Delusion of Asphalt**. Currently, he is the **Operations Consultant & the Technical Advisor** at **GEOTECH** and an independent **Drilling Operations Consultant** of various engineering services providers to the international clients as he offers his expertise in many areas of the **drilling & petroleum discipline** and is well **recognized & respected** for his process and procedural expertise as well as ongoing participation, interest and experience in continuing to promote technology to producers around the world.

Throughout his long career life, Dr. Chris has worked for many international companies and has spent several years **managing** technically **complex wellbore interventions** in both **drilling & servicing**. He is a **well-regarded** for his **process** and **procedural expertise**. Further, he was the **Operations Manager** at **ETP Crude Oil Pipeline Services** where he was fully responsible for optimum operations of crude oil pipeline, **workover** and **directional drilling**, **drilling rigs** and equipment, drilling of various geothermal deep wells and **exploration wells**. Dr. Chris was the **Drilling & Workover Manager & Superintendent** for **Kavala Oil** wherein he was responsible for supervision of **drilling operations** and **offshore exploration**, quality control of performance of **rigs**, **coiled tubing**, crude oil transportation via pipeline and abandonment of **well** as per the API requirements. He had occupied various key positions as the **Drilling Operations Consultant**, **Site Manager**, **Branch Manager**, **Senior Drilling & Workover Manager & Engineer** and **Drilling & Workover Engineer**, **Operations Consultant**, **Technical Advisor** in several petroleum companies responsible mainly on an **offshore** sour oil field (under water flood and gas lift) and a gas field. Further, Dr. Chris has been a **Professor** of the **Oil Technology College**.

Dr. Chris has **PhD** in **Reservoir Engineering** and a **Master's** degree in **Drilling & Production Engineering** from the **Petrol-Gaze Din Ploiesti University**. Further, he is a **Certified Surfaced BOP Stack Supervisor** of **IWCF**, a **Certified Instructor/Trainer**, a **Certified Trainer/Assessor/Internal Verifier** by the **Institute of Leadership & Management (ILM)** and has conducted **numerous short courses**, **seminars** and **workshops** and has published several technical books on **Production Logging**, **Safety Drilling Rigs** and **Oil Reservoir**.

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 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 Hydraulic Fracturing: Principles & Historical Development
0930 – 0945	<i>Break</i>
0945 – 1030	Rock Mechanics & Fracture Mechanics: Basic Concepts Crucial for Understanding Fracturing
1030 – 1130	Fracturing Fluids & Proppants: Types, Properties & Selection Criteria
1130 – 1215	Fracture Geometry & Propagation: How Fractures Initiate & Propagate in Subsurface Formations
1215 – 1230	<i>Break</i>
1230 – 1330	Design Considerations for Vertical Wells: Specific Challenges & Strategies
1330 – 1420	Environmental & Safety Considerations: Addressing Concerns & Regulatory Compliance
1420 – 1430	Recap
1430	<i>Lunch & End of Day One</i>

Day 2

0730 – 0830	Fracture Design & Treatment Optimization: Techniques for Designing Effective Fracturing Treatments
0830 – 0930	Numerical Simulation of Fractures: Modeling Tools & Methodologies
0930 – 0945	<i>Break</i>
0945 – 1100	Pressure & Rate Transient Analysis in Fractured Wells: Interpretation & Applications



1100 – 1215	Data Acquisition & Monitoring Techniques: Importance of Data in Designing & Modifying Fracture Treatments
1215 – 1230	Break
1230 – 1420	Case Studies of Fracturing in Vertical Wells: Analysis & Learnings
1420 – 1430	Recap
1430	Lunch & End of Day Two

Day 3

0730 – 0830	Unique Aspects of Fracturing Horizontal Wells: Differences from Vertical Well Fracturing
0830 – 0930	Multi-Stage Fracturing in Horizontal Wells: Design & Execution
0930 – 0945	Break
0945 – 1100	Completion Techniques for Horizontal Wells: Strategies & Technologies
1100 – 1215	Well Spacing & Fracture Interference: Managing Well Interactions in Field Development
1215 – 1230	Break
1230 – 1330	Production Analysis Post-Fracturing: Assessing the Effectiveness of Fracturing
1330 – 1420	Group Activity: Planning a Multi-Stage Fracture Treatment for a Horizontal Well
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4

0730 – 0830	High-Volume Fracturing & Zipper Fracs: Large-Scale Fracturing Operations
0830 – 0930	Re-Fracturing Techniques: Criteria, Challenges & Benefits
0930 – 0945	Break
0945 – 1100	Integration of Fracturing with Reservoir Simulation: Enhancing Reservoir Models with Fracturing Data
1100 – 1215	New Developments in Fracturing Fluids & Proppant Technology: Latest Advancements & Their Implications
1215 – 1230	Break
1230 – 1330	Managing Flowback & Produced Water: Strategies & Environmental Considerations
1330 – 1420	Case Study Review: Analyzing Advanced Fracturing Operations
1420 – 1430	Recap
1430	Lunch & End of Day Four

Day 5

0730 – 0830	Challenges in Deep & Tight Formations: Special Considerations for Difficult Environments
0830 – 0930	Best Practices in Fracturing Operations: Ensuring Efficiency & Minimizing Environmental Impact
0930 – 0945	Break
0945 – 1100	Economic Evaluation of Fracturing Projects: Cost-Benefit Analysis & Optimization
1100 – 1230	Hydraulic Fracturing Regulations & Public Perception: Navigating Regulatory & Social Landscapes

1230 – 1245	Break
1245 – 1345	<i>Future Trends in Hydraulic Fracturing: Innovations & Emerging Technologies</i>
1345 – 1400	Course Conclusion
1400 – 1415	POST-TEST
1415 – 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch & End of Course</i>

Practical Sessions

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



Course Coordinator

Jaryl Castillo, Tel: +974 4423 1327, Email: jaryl@haward.org