COURSE OVERVIEW DE0198
Drilling and Well Completion
(E-Learning Module)

Course Title
Drilling and Well Completion
(E-Learning Module)

Course Reference
DE0198

Course Format & Compatibility
SCORM 1.2. Compatible with IE11, MS-Edge, Google Chrome, Windows, Linux, Unix, Android, IOS, iPadOS, macOS, iPhone, iPad & HarmonyOS (Huawei)

Course Duration
30 online contact hours
(3.0 CEUs/30 PDHs)

Course Description

This E-Learning course is designed to provide participants with a detailed and up-to-date overview of drilling and well completion. It covers the main rig components, steps to drill an oil/gas well, drilling rig, rig power system and hoisting system; the derrick, tripping out, block and tackle, mechanical advantage, pully and rotary drilling rigs; the various types of wells drilling rigs including land rigs, rotating rig types, inland barges, barge mounted rigs, posted barge mounted rigs, submersible rigs, etc.; the rotary drilling process; and the rig power system and power-system performance characteristics.

Further, the course will also discuss the capacity and displacement nomenclature; the circulating system and its components; the pump displacement, contaminant removal, well monitoring system, parameters displayed and well control system; the oil well casing and tubing, conductor casing, surface casing, intermediate casing and well completion; the advantages and disadvantages of perforated liner completion; the advantages and disadvantages of perforated liner completion; the hole volume calculations, single string flowing well completion and multi zone well completion; and the components of a typical well and main configurations of production string(s).

During this course, participants will learn the single-zone completions with a tubing and a production packer including multiple-zone completions and parallel tubing string completion; the tubing-annulus completion, alternate selective completion, tubingless completions and remedial cementing; the production control, in steam injection wells, well prepared & stimulation and setting permanent packer; the packer milling assembly, method of setting retrievable packers and method of setting hydraulic set retrievable packers; the consideration hydraulic set retrievable packers; dual packer systems, production optimization and well productivity; the artificial lift strategy, techniques, selection parameters and selection process; the reservoir analysis, wellbore analysis and qualitative artificial lift selection; the nodal analysis, well performance analysis, well nodal analysis and production tubing; and the sand control management, flow assurance and operability and well performance analysis.

Course Objectives

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

- Apply and gain an in-depth knowledge on drilling and well completion
- Identify the main rig components, steps to drill an oil/gas well, drilling rig, rig power system and hoisting system
- Discuss derrick, tripping out, block and tackle, mechanical advantage, pully and rotary drilling rigs
- Recognize the various types of wells drilling rigs including the land rigs, rotating rig types, inland barges, barge mounted rigs, posted barge mounted rigs, submersible rigs, etc.
- Carryout rotary drilling process and describe rig power system and power-system performance characteristics
- Discuss capacity and displacement nomenclature as well as circulating system and its components
- Determine pump displacement, contaminant removal, well monitoring system, parameters displayed and well control system
- Illustrate oil well casing and tubing, conductor casing, surface casing, intermediate casing and well completion
- Explain the advantages and disadvantages of perforated liner completion
- Illustrate hole volume calculations, single string flowing well completion and multi zone well completion
- Identify the components of a typical well and the main configurations of production string(s)
- Recognize single-zone completions with a tubing and a production packer including multiple-zone completions and parallel tubing string completion
- Determine tubing-annulus completion, alternate selective completion, tubingless completions and remedial cementing
- Carryout production control, in steam injection wells, well prepared & stimulation and setting permanent packer

- Employ packer milling assembly, method of setting retrievable packers and method of setting hydraulic set retrievable packers
- Select consideration hydraulic set retrievable packers and recognize dual packer systems, production optimization and well productivity
- Apply artificial lift strategy, techniques, selection parameters and selection process
- Implement reservoir analysis, wellbore analysis and qualitative artificial lift selection
- Carryout nodal analysis, well performance analysis, well nodal analysis and production tubing
- Apply sand control management, flow assurance and operability and well performance analysis

Who Should Attend

This course provides an overview of all significant aspects and considerations of drilling and well completion for drilling, reservoir, well, production completion and petroleum engineers, supervisors and geologists who need a practical understanding and appreciation of drilling and completion technology.

Training Methodology

This Trainee-centered course includes the following training methodologies:-

- Talking presentation Slides (ppt with audio)
- Simulation & Animation
- Exercises
- Videos
- Case Studies
- Gamification (learning through games)
- Quizzes, Pre-test & Post-test

Every section/module of the course ends up with a Quiz which must be passed by the trainee in order to move to the next section/module. A Post-test at the end of the course must be passed in order to get the online accredited certificate.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- USA International Association for Continuing Education and Training (IACET)

  Haward Technology is an Authorized Training Provider by the International Association 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 1-2013 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 1-2013 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 Association 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 Fee

As per proposal

Course Contents

- Drilling
- Main Rig Components
- Main Topics in Drilling
- Steps To Drill an Oil/Gas Well
- Drilling Rig
- Rig Power System
- Hoisting System
- Derrick
- Making a Trip
- Making a Connection / Tripping In
- Tripping Out
- Block and Tackle
- Mechanical Advantage
- Pully
- Block and Tackle
- Drawworks
- Efficiency Factor, E
- Example
- Rotary Drilling Rigs
- Types of Wells
- Types of Drilling Rigs
- Common types of drilling rigs
- Land Rigs
- Rotating rig types
- Inland Barges
- Barge mounted rigs
- Posted barge mounted rigs
- Submersible Rigs
- Jack-up Rigs
- Semi-Submersible

- Drill Ships
- Structure Rigs
- Rotary Drilling Process
- Rig Power System
- Power-System Performance Characteristics
- Quiz – A
- Drawworks
- Rotary System
- Swivel
- Kelly
- Rotary Drive
- Rotary Table
- Drill Pipe
- Drill Collar
- Capacity and displacement nomenclature
- Table 1.5 Dimensions and Strength of API Seamless internal upset drill pipe
- Table 1.6 average displacement for range 2 drill pipe
- Circulating System
- Components of the circulating system
- Pump Displacement
- Contaminant Removal
- Well Monitoring System
- Parameters displayed
- Well Control System
- Basic understand of oil well casing and tubing
- Casing and Tubing Schematic without Liner
- Conductor Casing
- Surface Casing (Structural Casing)
- Intermediate Casing
- Casing Liner
- Production Casing
- Production Liner
- Production Tubing

- What is Well Completion
- Video No.1
- Areas
- Cased-Hole Completions
- Exercise -1:
- Advantages
- Disadvantages
- Open Hole Completion
- Perforated Liner Completion- Advantages
- Perforated Liner Completion- Disadvantage
- Gravel Pack
- Comparison of Completions
- Hole Volume Calculations
- Single String Flowing Well Completion
- Case Study
- Quiz
- Multi Zone Completions
- Multi Zone Well Completion
- Case Study: Optimizing Multizone Coalbed Methane Well Completions
- Components of a Typical Well
- Main Configurations of Production String(s)
- Hole Volume Calculations
- Conventional Completion
- Single-Zone Completions with a tubing and a Production Packer
- Multiple-Zone Completions
- Parallel Tubing String Completion
- Tubing-Annulus Completion
- Alternate Selective Completion
- Tubingless Completions
- Single-Zone Tubingless Completions
- Multiple-Zone Tubingless Completions
- Remedial Cementing
- Re-Establishing Pay Zone-Borehole Communication

- Quiz – 2
- Side Pocket Mandrel (SPM)
- Packers
- What is Packer
- Why Run a Packer
- Production Control
- In Steam Injection Wells
- Well Prepared & Stimulation
- HSE Reasons
- Typical Packer
- General Mechanism
- Case Study-3
- Quiz - 4
- Permanent Packers
- Tubing Connection
- Permanent Packers
- Method of Setting – Permanent Packers
- Setting Permanent Packer
- Mechanical Set Packer
- Principle of Operation
- Packer Milling Assembly
- Retrievable Packers
- Method of Setting Retrievable Packers
- Hydraulic Set Packer
- Case Study – 4
- Case Study – 5
- Quiz – 5
- Method of Setting Hydraulic Set Retrievable Packers
- Hydraulic Set Retrievable Packers
- Exercise – 2
- Selection Consideration Hydraulic Set Retrievable Packers
- Dual Packer Systems
- The Wellhead

- X-Mas Tree
- Case Study – 6
- Quiz – 6
- Overview of Production Optimization
- Well Productivity
- Overview of Artificial Lift
- Artificial Lift Strategy
- Artificial Lift Techniques
- A/L Selection Parameters
- Artificial Lift Selection Process
- Overview of Artificial Lift
- Major forms of artificial lift
- A/L Methodology
- Reservoir Analysis
- Wellbore Analysis
- Qualitative A/Ls Selection
- Case Study – 7
- Case Study – 8
- Case Study - 9
- Case Study - 10
- Quiz – 7
- Relative Advantages and Disadvantages of SRP Systems
- Nodal Analysis
- Vertical Lift Performance
- Inflow Performance
- Well Performance Analysis
- Exercise - 7
- Well Nodal Analysis
- Quiz - 8
- Production Tubing
- Production Tubing- Technologies
- Production Tubing- Advance Completions
- Production Tubing- Intelligent Tubing

- Intelligent Well Completion System
- Sand Control Management
- Flow Assurance and Operability
- Well Performance Analysis
- Well Performance Analysis- Well Stimulation
- Flow Assurance- WELL PRODUCTIVITY
- Quiz - 9
- Stimulation
- Theory – Propellant Stimulation
- Application of Propellant Stimulation
- Where to Use STIMGUN?
- Isolation
- Case History
- Reducing Operating Costs
- Solid Answers to Mature-Field Challenges
- Solid and Reliable System for Increased Production Capacity
- MetalSkin Cased-Hole Liner Versus Conventional Alternatives
- Solid Performance Advantages the only Solid-Expandable, Cased-Hole Liner With No Drillout Required.
- Quick, One-trip Installation for a Reliable, Long-term Solution
- Solid Results from Around The World
- Advancing the Design of Solid-Expandable Liner Connections
- Quiz - 10