# COURSE OVERVIEW DE0852
# Advanced Drilling Practices (E-Learning Module)

## Course Title
Advanced Drilling Practices
(E-Learning Module)

## Course Reference
DE0852

## 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 is designed to provide participants with an advanced overview of drilling practices. It covers the drilling of a well cost effectively and maximizing penetration rate; the evaluation of stuck pipe problems, avoidance of potential problems and optimization of hole cleaning and ROP; the design, drill string and BOP/wellheads; the designing and implementation of bit and hydraulics programs; the evaluation of well control problems; the use of mud logging principles and techniques; and the petroleum process, oil exploration, team work communications and drilling services.

During this course, the participants will learn the drilling sequence, BHA design and components; the drilling of rig and the history of PDC's; the main features of PDC's and its design; the body material, bit profile, gauge, body materials, bit profile, gauge protection, cutter shape and hydraulics; the uses of PDC bits and its other applications; the limitations of PDC bits and possible PDC bit improvements; viscosity and shear rate; and the causes of plastic viscosity changes and methods to decrease plastic viscosity.

## Course Objectives

After completing the course, the employee will:-

- Apply and gain a comprehensive knowledge on facies analysis and rock typings
- Drill a well cost effectively and maximize penetration rate
- Evaluate stuck pipe problems and avoid potential problems by optimizing hole cleaning and ROP
- Design, drill string and BOP/wellheads
- Design and implement bit and hydraulics programs
- Recognize and evaluate well control problems by effectively using Mud Logging principles and techniques
- Describe petroleum process as well as employ oil exploration, team work communications and drilling services
- Determine the drilling sequence, illustrate BHA design and identify components
- Recognize drilling rig and discuss the history of PDC's
- Identify the main features of PDC's and describe its design
- Recognize body material, bit profile, gauge, body materials, bit profile, gauge protection, cutter shape and hydraulics
- Identify the uses of PDC bits and its other applications
- Determine the limitations of PDC bits and recognize possible PDC bit improvements
- Define viscosity and explain its importance in a technical manner
- Discuss shear rate as well as illustrate shear stress and plastic viscosity
- Identify the causes of plastic viscosity changes and apply methods to decrease plastic viscosity

## Who Should Attend

This course provides an advanced overview on drilling practices for senior engineers, field and drilling personnel, drilling engineering supervisors, drilling operations section leaders, tool pushers, managers, well engineers and other technical staff who are involved in the planning and implementation of drilling programs.

## 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

## 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 Contents

- Petroleum Process
- Oil Exploration
- Team Work Communications
- Drilling Services
- Drilling Sequence
- BHA Design & Components
- Drilling Rig
- History of PDC's
- Main Features of PDC's
- PDC Bit Design
- Body Material
- Bit Profile
- Gauge Protection
- Cutter Shape
- Hydraulics
- Uses of PDC Bits
- Other Application of PDC Bits
- Limitations of PDC Bits
- Possible PDC Bit Improvements
- Well Types
- Site Preparation

- Drilling Sequence
- Cementing Equipment
- Viscosity – Simple Definition
- Viscosity – Importance
- Viscosity – Technical Definition
- Shear rate – Definition
- Shear Stress/Shear Rate Illustration
- Plastic Viscosity – Definitions
- Causes of Plastic Viscosity Changes
- Methods to Decrease Plastic Viscosity
- Yield Point – Definitions
- Causes of Yield Point Increases
- Methods for Decreasing Yield Points
- Gel Strength – Definition
- Gel Strength – Importance
- Rheology Models
- Newtonian Fluids
- Non-Newtonian Fluids
- Rheological Models
- Bingham Plastic Equation
- Bingham Plastic Model
- Power Law Equation
- Power Law Model
- n Value
- “n” Value Relationships
- K Value
- “K” Value Relationships
- Power Law Model Weakness
- Filtration Control
- Filtration Control Importance
- Filtration Control Types
- Static Filtration Characteristics
- Dynamic Filtration Characteristics
- Fluid Loss Measurement Static (API)

- Fluid Loss – Static (HTHP)
- Fluid Loss Measurement Static HT-HP
- API vs HT-HP
- Dynamic HT-HP
- Darcy's Law
- Relationship of Filtrate Volume vs Times
- Filter Cake Quality
- Filter Cake Materials – Beneficial
- Logging Services
- BHA Design (Components)
- Stuck Pipe
- Fishing Operations & Tools
- Side Track Operations (Including Whip Stock Technique)
- Safety Alerts
- Sticking Mechanisms
- First Actions
- Unconsolidated Formations
- Mobile Formations
- Fracture and Faulted Formations
- Naturally Over-pressure Shale Collapse
- Reactive Formations
- Hole Cleaning
- Techtonically Sressed Formations
- Solids Induced Pack-Off
- Kill Sheet
- Drilling Practices – Different Problems Linked with Actual Case Studies
- Drilling Problems
- AEB-3 Problem & Required Fishing Operations
- Drilling Practices – Actual Drilling Well Case Study
- Alamein Field
- Well NEAL-21 Summary
- Well NEAL-21 Summary – Lithology Column CSG Design
- NEAL # 21 Drilling History
- NEAL # 21 Drilling Parameters (12 ¼" OH)

- NEAL # 21 Drilling History - 8 ½" Vertical Section
- NEAL # 21 Drilling Parameters (8 ½" OH)
- NEAL # 21 OHL, 7" Liner W/ CMT & CBL-VDL-GR-CCL
- NEAL # 21 (WBS, CSG & CMT Summary)
- NEAL # 21 Progress Charts (Time VS Depth)
- NEAL # 21 Progress Charts (Cost VS Depth)