COURSE OVERVIEW DE0133
Core and Log Integration (E-Learning Module)

Course Title
Core and Log Integration
(E-Learning Module)

Course Reference
DE0133

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 a detailed and up-to-date overview of core and log integration. It covers the coring and coring analysis, coring process and coring techniques; the conventional coring, sponge core, sidewall coring and rotary sidewall core; the core type and coring; the core recovery, core preservation while transportation, core orientation and marking; and the sampling for core analysis, core plugging, soxhlet cleaning technique and core analysis.

During this interactive course, participants will learn the major types of core analysis including conventional (routine) core analysis, core gamma log, core photography, fluid saturation and routine core analysis measurements; the reservoir rock properties, measurements of porosity, measurements of permeability, factors affecting permeability measurement, porosity and permeability; the fluid saturations - core analysis, application of core saturations; estimating fluid contact depths from core saturations; and the mercury injection, centrifuge technique, porous plate – drainage and comparison of capillary pressure methods.

Course Objectives

After completing the course, the employee will:-

- Apply and gain an in-depth knowledge on core and log integration
- Learn the key objectives of log to core calibration, including porosity, lithology, saturation, and petrophysical rock types
- Learn understanding of how the integration of lithology, pore geometry, porosity, permeability, and water saturation can improve a static reservoir mode
- Carryout coring and coring analysis, coring process (planning – goals) and coring techniques
- Recognize conventional coring, sponge core, sidewall coring (wire line core gun) and rotary sidewall core
- Explain conventional coring versus sidewall coring including the wireline coring advantages and conventional core advantages
- Select core type and coring fluid as well as apply core recovery, core preservation while transportation, core orientation and marking
- Employ sampling for core analysis, core plugging, soxhlet cleaning technique and core analysis
- Identify the major types of core analysis including conventional (routine) core analysis, core gamma log, core photography, fluid saturation and routine core analysis measurements
- Determine reservoir rock properties, measurements of porosity, measurements of permeability, factors affecting permeability measurement, porosity and permeability
- Carryout fluid saturations - core analysis, application of core saturations and estimating fluid contact depths from core saturations
- Perform special core analysis measurements, sample protocol, capillary pressure, uses of capillary pressure data and capillary pressure measurements
- Determine mercury injection, centrifuge technique, porous plate – drainage and comparison of capillary pressure methods

Who Should Attend

This course provides an overview of all significant aspects and considerations of core and log integration for drilling engineers, production engineers, reservoir engineers, completion engineers, drilling and facilities engineers and field operators.

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

- Coring and Coring Analysis
- Why We Core?
- Objectives of a Coring Program
- Engineering Objectives
- Geological Objectives
- In summary
- Who are Concern?
- Coring Process (Planning – Goals)
- The five part coring process
- Coring Techniques
- While Drilling
- After Drilling
- Conventional Coring
- Sponge Core
- Sidewall Coring (Wire line Core Gun)
- Rotary Sidewall Core
- Conventional Coring versus Sidewall Coring
- Wireline Coring Advantages
- Conventional Core Advantages

- Selection of the core type and coring fluid
- Selection of Core Type depend on
- Summary of Coring Techniques
- Core Recovery
- Core Preservation while Transportation
- Core Unpacking and Layout
- How has the core been caught?
- There should be sufficient table space available to layout all of the core as it is unpacked from boxes or liners
- Wellsite box logs and sample lists (e.g. wax preserved pieces) should be checked for accuracy
- Core Orientation and Marking
- Sampling for Core Analysis
- Core Plugging
- Soxhlet Cleaning Technique
- Objectives of Core Analysis
- reservoir engineer
- production technologist
- Summary of Coring Analysis Objectives
- Major Types of Core Analysis
- Conventional (Routine) Core Analysis
- Core Gamma Log
- Core Photography
- Fluid Saturation
- Routine Core Analysis Measurements
- Reservoir Rock Properties
- Measurements of Porosity
- Measurements of Permeability
- Klinkenberg Permeability
- Factors Affecting Permeability Measurement
- Advantages
- Disadvantages
- Porosity

- Permeability
- Saturations Via Dean Stark
- Fluid Saturations - Core Analysis
- Factors affecting fluid saturations in cores
- Application of Core Saturations
- Estimating Fluid Contact Depths from Core Saturations
- Maximum Water Saturation for Oil and Gas Production
- Geological and petrophysical data used to define flow units
- Special Core Analysis Measurements (SCAL)
- SCAL Sample Protocol
- Capillary Pressure
- Uses of Capillary Pressure Data
- Capillary Pressure Measurements
- Mercury Injection
- Centrifuge Technique
- Porous plate – drainage
- Comparison of Capillary Pressure Methods
- Wettability
- Wettability Classification
- Fractional Wet
- Mixed Wet
- Neutral
- Wettability Effects on Oil recovery
- Strongly Water Wet
- Strongly Oil Wet
- The Amott Method
- Centrifuge Method
- Contact Angle Method
- Relative Permeability
- end-point saturations
- end-point of relative permeabilities
- Effect of Wettability for Increasing Sw
- Imbibition Relative Permeability

- Steady-state Method
- Unsteady-state Method
- Relative Permeability Measurements
- Electrical Properties
- Formation Factor and “m”
- Resistivity Index and “n”
- Resistivity Index
- Effect of Overburden and Temperature on Resistivity
- Effect of Brine Resistivity on F
- Example - Archie water saturation, Sw
- Another Core Analysis Tests
- Additional Testing
- Petrology
- Unslabbed Core Description - what are we dealing with?
- Mineralogical Sample Screening - minimising the risk of laboratory induced damage
- Unslabbed Core Description - what are we dealing with?
- Core Description Format
- Thin Section Petrography
- SEM
- XRD
- X-ray Scanning
- CAT Scanning