COURSE OVERVIEW DE0526
Basic Open Hole Tools

Course Title
Basic Open Hole Tools

Course Date/Venue
Session 1: January 19-23, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
Session 2: July 21-25, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
DE0526

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description

This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

This course is designed to provide participants with a detailed and up-to-date overview of Open Hole Logging Methods and Formation Evaluation. It covers the importance of open hole logging in subsurface exploration; the relationship between rock types, porosity, permeability and fluid saturation; the petrophysical rock/fluid properties, geological formation and rock types; the role of well logging in subsurface exploration and reservoir evaluation; the different rock formations and fluid contents affecting logging data; the wireline logging, TLC (tough logging conditions) and logging while drilling (LWD); and the comparison between wireline and LWD.

Further, the course will also discuss the logging conveyance in difficult wells; the best practices for selecting logging methods; how tool responses translate into petrophysical properties and how logging tools measure porosity using neutron, density and sonic logs; the water saturation calculation and techniques for estimating permeability from well log data; the fluid types covering oil, gas and water; and the use of crossplots to interpret porosity, saturation and lithology from log data.

During this interactive course, participants will learn the integration of petrophysical results with geology, using well logs for reservoir properties evaluation and validating logging results with physical core data; collaborating with geologists, reservoir engineers and geophysicists for comprehensive formation evaluation; evaluating uncertainty in logging results to identify and manage uncertainties in petrophysical interpretations; the new high-tech logging tools and how NMR measures porosity, permeability and fluid types; the advanced tools for identifying fractures, bedding planes and lithology; the benefits of dielectric logs in evaluating water saturation in complex reservoirs; the formation pressure while drilling (FPWD); and the future trends in logging and evaluation.

Course Objectives

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

- Apply and gain an in-depth knowledge on open hole logging methods and formation evaluation
- Understand relationship between geology, petrophysical rock/fluid properties and logging tools responses
- Understand the basic principles and differences of logging conveyance methods (Wireline, TLC and LWD)
- Learn how to convert logging tool responses in to petrophysical rock and fluid properties
- How to apply and crosscheck the results with other concerned disciplines
- Basic physics and benefits of use of new high-tec tools
- Discuss the importance of open hole logging in subsurface exploration
- Identify the relationship between rock types, porosity, permeability and fluid saturation
- Recognize the petrophysical rock/fluid properties, geological formation and rock types
- Identify the role of well logging in subsurface exploration and reservoir evaluation and explain how different rock formations and fluid contents affecting logging data
- Explain wireline logging, TLC (tough logging conditions) and logging while drilling (LWD) as well as the comparison between wireline and LWD
- Apply logging conveyance in difficult wells as well as the best practices for selecting logging methods
- Explain how tool responses translate into petrophysical properties and how logging tools measure porosity using neutron, density and sonic logs
- Apply water saturation calculation and techniques for estimating permeability from well log data
- Identify fluid types covering oil, gas and water and use crossplots to interpret porosity, saturation and lithology from log data
- Integrate petrophysical results with geology, use well logs for reservoir properties evaluation and validate logging results with physical core data

- Collaborate with geologists, reservoir engineers and geophysicists for comprehensive formation evaluation
- Evaluate uncertainty in logging results to Identify and manage uncertainties in petrophysical interpretations
- Recognize the new high-tech logging tools and explain how NMR measures porosity, permeability and fluid types
- Carryout advanced tools for identifying fractures, bedding planes and lithology
- Identify the benefits of dielectric logs in evaluating water saturation in complex reservoirs
- Discuss the formation pressure while drilling (FPWD) and the future trends in logging and evaluation

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 open hole logging methods and formation evaluation for open hole and cased hole for petroleum engineers, production engineers, drilling engineers, reservoir engineers, geologists, log analysts 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$ 8,000 per Delegate + **VAT**. 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: -

- 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.

- 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.

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:

Mr. Fred Lazor is a **Senior Petrophysicist** and **Consultant** with **40 years** of extensive experience in the **Oil & Gas** industry. His area of expertise includes **AVO, Inversion & Seismic Attributes**, **Production Geology**, **Well Composite**, **Construction Integrity & Completion**, **Special Core Analysis**, **Field Development Planning**, **Cased Hole Log Analysis** of the Spectral Saturation Tool, **Production Logs**, **Sector Cement Bond Logs** and **Multi-finger Calliper Logs** using Warrior and other internal software analysis packages. Currently, he is working as a **Senior Petrophysicist** for **Shell Oil Company** in **Pittsburgh**, **USA**. Moreover, he is a **Trainer** in log analysis for petroleum engineers, geologists, petrophysicists and others involved in such activities.

During his career life, Mr. Lazor has lead various teams of **petroleum engineers**, **geologists**, **reservoir engineers** and **petrophysicists** to conduct **field studies** in **major oil companies** in the **USA**, **Europe**, **South East Asia** and the **Middle East**. One of his many achievements when he was a **Consultant Petrophysicist** at Kuwait Oil Company (**KOC**) was to lead a team of petrophysicists assigned to develop the **South Raqta Field** in to one of the **leading heavy oil producing reservoirs in the world**. Further, he has occupied numerous prime positions in multinational companies including **Vice President** and **Chief Petrophysicist** at the **National Petroleum Technology Company** in Saudi Arabia and **Chief Petrophysicist** & **Consultant** in **Shell Oil Company**, **Southwestern Energy Company, Schlumberger, TEXACO** and **Simon Geolithic**.

Mr. Lazor has a **Bachelor** degree in **Petroleum Engineering** & **Physics** from the **University of Texas**, **USA**. He is a **Fellow** of **SPE** and has various publications presented over the years and **circulated worldwide**.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction to Open Hole Logging:*** *Definition, Applications and Importance in Subsurface Exploration*
0930 – 0945	*Break*
0945 – 1030	***Geology & Petrophysics Overview:*** *Understanding the Relationship Between Rock Types, Porosity, Permeability and Fluid Saturation*

1030 – 1130	***Petrophysical Rock/Fluid Properties:*** *Key Properties such as Porosity, Permeability and Water Saturation*
1130 – 1215	***Geological Formation & Rock Types:*** *Overview of Reservoir Rocks (Sandstone, Carbonates) and their Responses to Logging*
1215 – 1230	*Break*
1230 – 1330	***Fundamental Concepts of Well Logging:*** *The Role of Well Logging in Subsurface Exploration and Reservoir Evaluation*
1330 – 1420	***Linking Geology to Logging Tool Responses:*** *How Different Rock Formations and Fluid Contents Affect Logging Data*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Wireline Logging:*** *Basic Principles, Advantages, Limitations and Typical Tools Used*
0830 – 0930	***TLC (Tough Logging Conditions):*** *Understanding TLC and Its Applications in Complex Wells*
0930 – 0945	*Break*
0945 – 1100	***Logging While Drilling (LWD):*** *Basic Principles, Real-Time Data Acquisition and its Advantages Over Wireline Logging*
1100 – 1215	***Comparison Between Wireline & LWD:*** *Differences in Data Acquisition, Accuracy and Application*
1215 – 1230	*Break*
1230 – 1330	***Logging Conveyance in Difficult Wells:*** *Techniques for Logging in Deviated, Horizontal, or Deep Wells*
1330 – 1420	***Best Practices for Selecting Logging Methods:*** *Choosing Between Wireline, TLC and LWD Based on Well Conditions*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Tool Responses & Data Interpretation:*** *Understanding How Tool Responses Translate into Petrophysical Properties*
0830 – 0930	***Porosity Measurement Techniques:*** *How Logging Tools Measure Porosity Using Neutron, Density and Sonic Logs*
0930 – 0945	*Break*
0945 – 1100	***Water Saturation Calculation:*** *Using Resistivity Logs and Archie's Equation for Determining Water Saturation*
1100 – 1215	***Permeability Estimation:*** *Techniques for Estimating Permeability from Well Log Data*
1215 – 1230	*Break*
1230 – 1330	***Identifying Fluid Types (Oil, Gas, Water):*** *Using Resistivity and Porosity Logs to Differentiate Fluid Types*
1330 – 1420	***Crossplot Analysis:*** *Using Crossplots to Interpret Porosity, Saturation and Lithology from Log Data*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

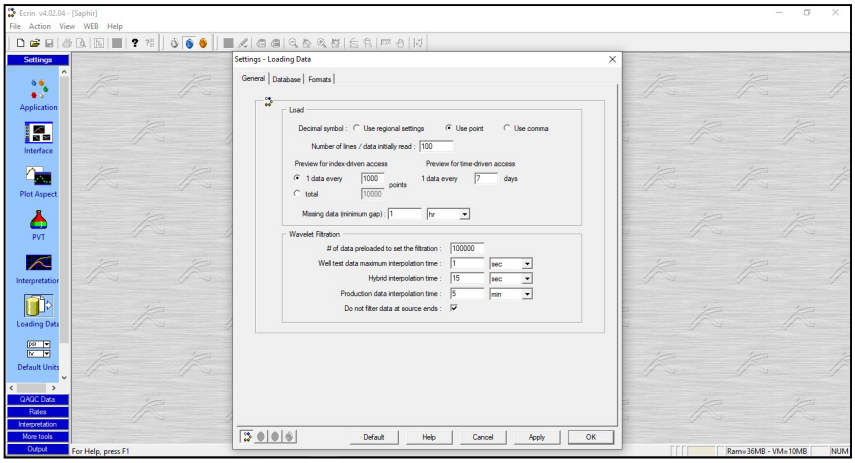
0730 – 0830	***Integrating Petrophysical Results with Geology:*** *Applying Logging Data in Geological Models*
0830 – 0930	***Reservoir Characterization:*** *Using Well Logs for Reservoir Properties Evaluation (Porosity, Thickness, Net-to-Gross Ratio)*
0930 – 0945	*Break*
0945 – 1100	***Crosschecking Logging Data with Core Samples:*** *Validating Logging Results with Physical Core Data*
1100 – 1215	***Cross-Disciplinary Application:*** *Collaborating with Geologists, Reservoir Engineers and Geophysicists for Comprehensive Formation Evaluation*
1215 – 1230	*Break*
1230 – 1330	***Evaluating Uncertainty in Logging Results:*** *Identifying and Managing Uncertainties in Petrophysical Interpretations*
1330 – 1420	***Case Study Analysis:*** *Reviewing Real-Life Examples of Integrated Logging Data for Formation Evaluation*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

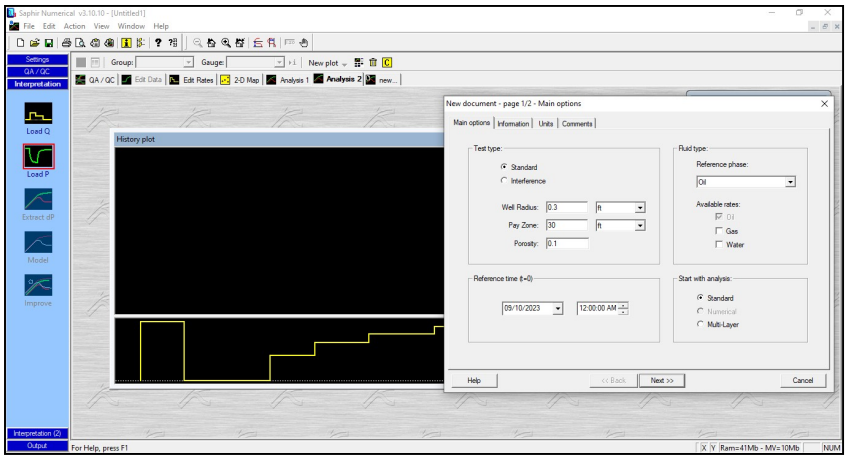
0730 – 0830	***Basics of New High-Tech Logging Tools:*** *Overview of the Latest Advancements in Logging Technologies*
0830 – 0930	***Nuclear Magnetic Resonance (NMR) Logging:*** *Understanding How NMR Measures Porosity, Permeability and Fluid Types*
0930 – 0945	*Break*
0945 – 1100	***High-Resolution Resistivity & Sonic Imaging:*** *Advanced Tools for Identifying Fractures, Bedding Planes and Lithology*
1100 – 1215	***Dielectric Logging:*** *Benefits of Dielectric Logs in Evaluating Water Saturation in Complex Reservoirs*
1215 – 1230	*Break*
1230 – 1300	***Formation Pressure While Drilling (FPWD):*** *Real-Time Pressure Measurements to Understand Reservoir Dynamics*
1300 - 1345	***Future Trends in Logging & Evaluation:*** *Exploring New Technologies and the Future of Formation Evaluation Techniques*
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

Practical session will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the simulator "KAPPA", "Interactive Petrophysics (IP)" and "ECRIN" software.



KAPPA Ecrin v4.02.04



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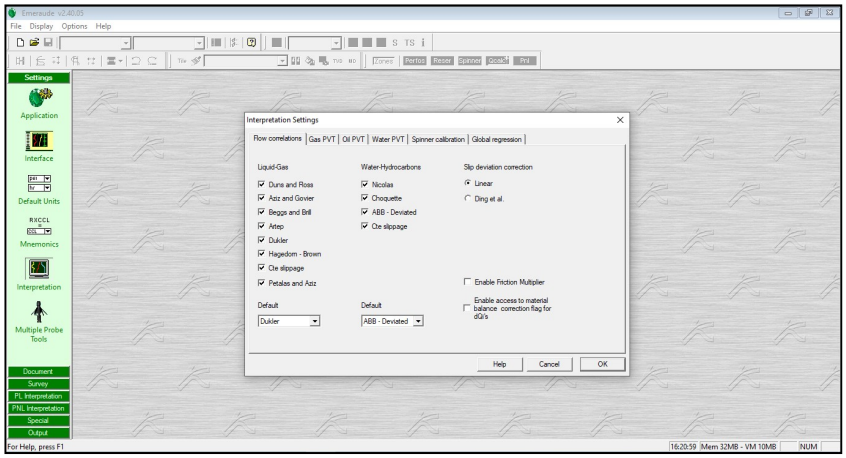

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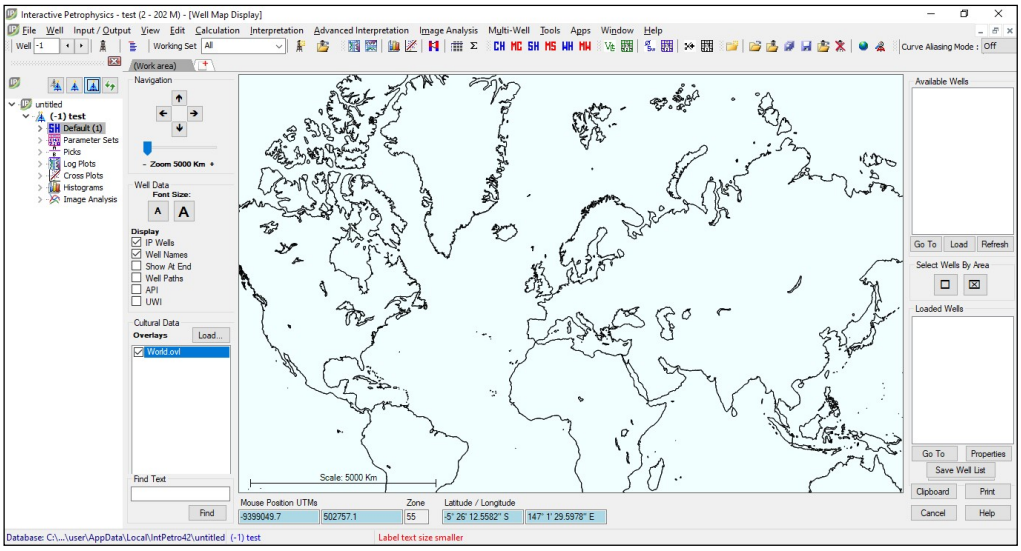
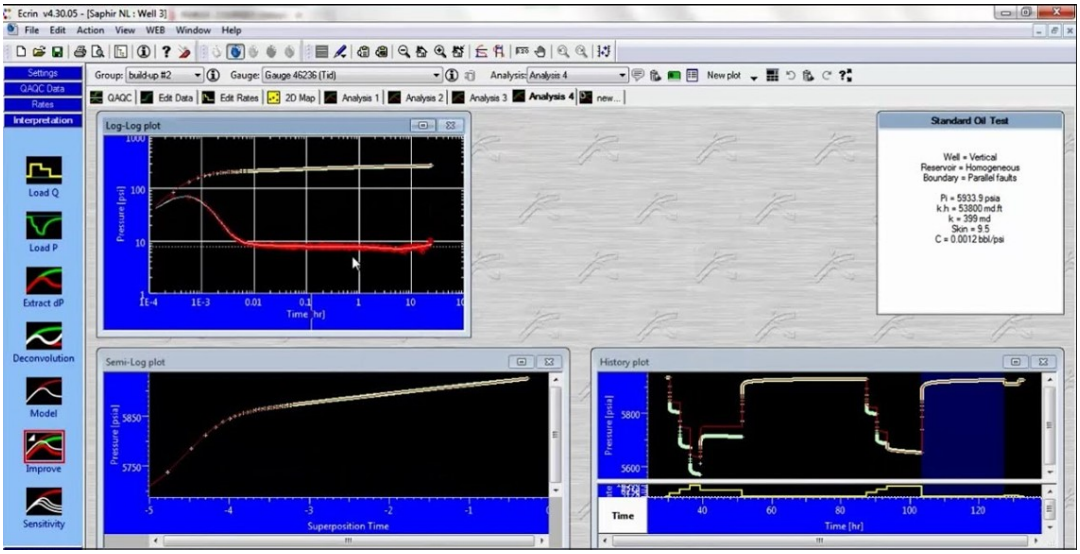


Interactive Petrophysics (IP) Software



ECRIN Software

Course Coordinator

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