

COURSE OVERVIEW DE0613

Advanced Carbonate Reservoir Characterization & Modelling

Course Title

Advanced Carbonate Reservoir
Characterization & Modelling

Course Date/Venue

Session 1: January 05-09, 2025/Boardroom 1,
Elite Byblos Hotel Al Barsha, Sheikh
Zayed Road, Dubai, UAE

Session 2: July 07-11, 2025/Fujairah Meeting
Room, Grand Millennium Al Wahda
Hotel, Abu Dhabi, UAE



Course Reference

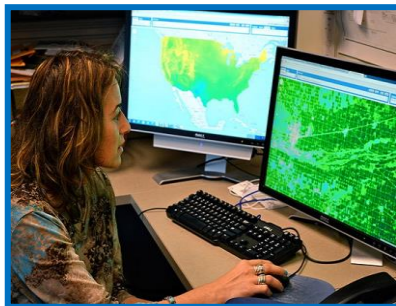
DE0613

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



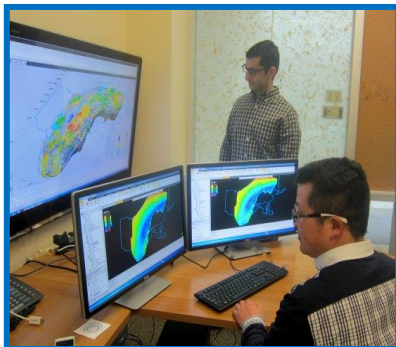
Course Description



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 Carbonate Reservoir Characterization and Modelling. It covers the carbonate reservoirs in the oil and gas industry; the fundamental of carbonate sedimentology and stratigraphy; the petrophysical properties that characterize carbonate reservoirs including porosity types and their impact on fluid flow; the diagenetic processes that affect carbonate reservoir quality like the dolomitization, cementation and dissolution; and classifying carbonate rocks based on their petrophysical properties and depositional textures.



Further, the course will also discuss the carbonate reservoir characterization including core analysis, well logging and seismic interpretation techniques; the high-resolution sequence stratigraphic techniques to predict carbonate reservoir distribution and quality; the advanced petrophysical analysis, seismic attributes and facies modeling, geochemical characterization and integration of microscopic and macroscopic data; the geological modeling concepts specific to carbonate reservoirs; and the construction of static geological models including structural, stratigraphic and property modeling.

During this interactive course, participants will learn the dynamic reservoir modeling; the techniques for modeling heterogeneity and anisotropy in carbonate reservoirs; the pore system characterization and modeling; the software tools used for carbonate reservoir characterization and modeling; the natural fractures in carbonate reservoirs and their impact on reservoir performance; the reservoir enhancement techniques including acid stimulation, hydraulic fracturing and tailored for carbonates; the unconventional carbonate reservoirs and enhanced oil recovery (EOR) in carbonate reservoirs; the unique challenges in managing carbonate reservoirs for optimal recovery; the recent technological advances and research directions in carbonate reservoir characterization and modeling; conducting integrated reservoir studies in carbonates; the strategies for field development planning and management based on carbonate reservoir characterization and modeling; the uncertainty analysis and risk assessment; and the digital rock physics techniques for enhancing carbonate reservoir characterization.

Course Objectives

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

- Apply and gain an in-depth knowledge on carbonate reservoir characterization and modelling
- Discuss carbonate reservoirs in the oil and gas industry and the fundamentals of carbonate sedimentology and stratigraphy
- Describe the petrophysical properties that characterize carbonate reservoirs including porosity types and their impact on fluid flow
- Examine the diagenetic processes that affect carbonate reservoir quality like the dolomitization, cementation and dissolution
- Classify carbonate rocks based on their petrophysical properties and depositional textures
- Apply carbonate reservoir characterization including core analysis, well logging and seismic interpretation techniques
- Apply high-resolution sequence stratigraphic techniques to predict carbonate reservoir distribution and quality
- Illustrate advanced petrophysical analysis, seismic attributes and facies modeling, geochemical characterization and integration of microscopic and macroscopic data
- Discuss the geological modeling concepts specific to carbonate reservoirs as well as the construction of static geological models including structural, stratigraphic and property modeling
- Describe dynamic reservoir modeling and apply techniques for modeling heterogeneity and anisotropy in carbonate reservoirs
- Carryout pore system characterization and modeling and identify software tools used for carbonate reservoir characterization and modeling
- Characterize the natural fractures in carbonate reservoirs and their impact on reservoir performance
- Apply reservoir enhancement techniques including acid stimulation and hydraulic fracturing tailored for carbonates

- Determine unconventional carbonate reservoirs and enhanced oil recovery (EOR) in carbonate reservoirs
- Identify and address the unique challenges in managing carbonate reservoirs for optimal recovery
- Explore the recent technological advances and research directions in carbonate reservoir characterization and modeling
- Conduct integrated reservoir studies in carbonates as well as apply strategies for field development planning and management based on carbonate reservoir characterization and modeling
- Employ uncertainty analysis and risk assessment and digital rock physics techniques for enhancing carbonate reservoir characterization

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 carbonate reservoir characterization and modelling for reservoir engineers, geophysicists 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. Saber Hussein is a **Senior Geologist & Reservoir Engineer** with over **40 years** of extensive experience within the **Oil & Gas, Petrochemical and Refinery** industries. His specialization widely covers in the areas of **Open Hole Logging** Methods, Open & Cased Hole Logging, Applied **Production Logging & Cased Hole & Production Log** Evaluation, **Cased Hole Logging & Formation** Evaluation, **Cased Hole** Logging, **Wireline Logging, Mud Logging, Production Logging, Reservoir** Management, **Reservoir Appraisal & Development, Carbonate Reservoir** Management, **Fractured Reservoirs** Evaluation & Management, **Naturally Fractured Reservoir**, Integrated **Carbonate Reservoir** Characterization, **Core & Log Integration, Water Saturation, Coring & Core Analysis, Special Core Analysis, Log** Interpretation, **Core Calibration, Geological Modelling for Integrated Reservoir Studies, Reservoir** Characterization, **Geomodelling, Development Geology, Petroleum Geology, Exploration Production, Structural Geology, Wellsite Geology, Geologic** Modelling, Analytic Modelling Methods, Economic Evaluation, **Geophysics, Geophysical Exploration, Advanced Petrophysics, Petroleum Exploration, Petroleum Economics, Petroleum Engineering, Reservoir Modelling, Reserve Estimation, Reserve Evaluation, Uncertainty Calculations, Reservoir Management, Reservoir Engineering, Tectonics & Structural Development, Petroleum Systems, Reservoir Characterization, Clastic Reservoir, Carbonate Reservoir, Subsurface Facies Analysis, Borehole Images, Geophysical Methods, Oil & Gas Exploration, Exploration Geochemistry, Reservoir Performance Using Classical Methods, Fractured Reservoir** Evaluation & Management, **Reservoir Surveillance & Management, Reservoir Engineering & Stimulation, Reservoir Monitoring, Pressure Transient Testing & Reservoir Performance Evaluation, Reservoir Characterization, Reservoir Engineering Applications, Reservoir Volumetrics, Water Drive Reservoir, Reservoir Evaluation, Slick Line, Coil Tubing, Horizontal Wells, Well Surveillance, Well Testing, Design & Analysis, Well Testing & Oil Well Performance, Well Log Interpretation (WLI), Formation Evaluation, Well Workover Supervision, Pressure Transient Analysis, Petrophysical Log Analysis, Drilling, Core Analysis, Core-to-Log Data Integration (SCAL), Basin Modelling & Total Petroleum System (TPS), Seismic Interpretation, Seismic Methods, Seismic Coherence Techniques, Seismic Attribute Analysis, Seismic Inversion Techniques, Well Logging, Rock Physics & Seismic Data, Formation Evaluation, Well Testing & Data Interpretation, Pore Pressure Prediction and Oil & Gas Reserves Estimations.**

During his career life, Mr. Saber has gained his practical and field experience through his various significant position and dedication as the **Exploration General Manager & Board Member, Geology General Manager, Geological Studies Assistant General Manager, Mud Logging Assistant General Manager, Geological Operations Department Head, Geological Operations Section Head, Geologist, Well-Site Geologist, Mud Logger, Reservoir Engineer, Pressure Engineer, Expert and Senior Technical Consultant/Instructor** for various international companies such as the Suez Oil Company, DECO, DISUCO, Segulled, Geoline, Ltd.

Mr. Saber has a **Bachelor's** degree in **Geology**. Further, he is a **Certified Instructor/Trainer** and an active member of Egyptian Petroleum Exploration Society (**EPEX**), American Association of Petroleum Geologists (**AAPG**), Government Sponsored Enterprise (**GSE**) and the Petroleum and Scientific Professional Syndicate. He has further delivered numerous trainings, courses, seminars and conferences internationally.

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	Overview of Carbonate Reservoirs: Introduction to Carbonate Geology, the Significance of Carbonate Reservoirs in the Oil & Gas Industry & their Distribution Worldwide
0930 – 0945	<i>Break</i>
0945 – 1030	Carbonate Sedimentology & Stratigraphy: Fundamentals of Carbonate Sedimentology, Depositional Environments & Stratigraphic Principles
1030 – 1130	Petrophysics of Carbonate Rocks: The Petrophysical Properties that Characterize Carbonate Reservoirs, including Porosity Types & their Impact on Fluid Flow
1130 – 1215	Carbonate Diagenesis: Examination of Diagenetic Processes that Affect Carbonate Reservoir Quality, such as Dolomitization, Cementation & Dissolution
1215 – 1230	<i>Break</i>
1230 – 1330	Rock Typing & Classification In Carbonates: Methods For Classifying Carbonate Rocks Based On Their Petrophysical Properties & Depositional Textures
1330 – 1420	Techniques for Carbonate Reservoir Characterization: Overview of Core Analysis, Well Logging & Seismic Interpretation Techniques Tailored for Carbonate Reservoirs
1420 – 1430	Recap
1430	<i>Lunch & End of Day One</i>

Day 2

0730 – 0830	High-Resolution Sequence Stratigraphy: Applying High-Resolution Sequence Stratigraphic Techniques to Predict Carbonate Reservoir Distribution & Quality
0830 – 0930	Advanced Petrophysical Analysis: Integration of NMR Logging, Dielectric Logging & Advanced Core Analysis Techniques for Detailed Reservoir Characterization
0930 – 0945	<i>Break</i>
0945 – 1100	Seismic Attributes & Facies Modeling: Using Seismic Attributes for Facies Identification & Modeling in Carbonate Reservoirs
1100 – 1215	Geochemical Characterization: Application of Geochemical Analysis for Understanding the Origin & Evolution of Carbonate Reservoirs
1215 – 1230	<i>Break</i>
1230 – 1330	Integration of Microscopic & Macroscopic Data: Strategies for Integrating Data from thin Sections, Core Analysis & Well Logs for Comprehensive Reservoir Characterization
1330 – 1420	Case Studies on Carbonate Reservoir Characterization: Discussion of Case Studies Illustrating Successful Characterization of Complex Carbonate Reservoirs
1420 – 1430	Recap
1430	<i>Lunch & End of Day Two</i>



Day 3

0730 – 0830	Fundamentals of Geological Modeling in Carbonates: Introduction to Geological Modeling Concepts Specific to Carbonate Reservoirs
0830 – 0930	Static Modeling of Carbonate Reservoirs: Construction of Static Geological Models, including Structural, Stratigraphic & Property Modeling
0930 – 0945	Break
0945 – 1100	Dynamic Reservoir Modeling: Basics of Dynamic Reservoir Modeling, Incorporating Fluid Flow Simulations in Carbonate Reservoirs
1100 – 1215	Handling Heterogeneity & Anisotropy: Techniques for Modeling Heterogeneity & Anisotropy in Carbonate Reservoirs
1215 – 1230	Break
1230 – 1330	Pore System Characterization & Modeling: Approaches to Characterize & Model the Complex Pore Systems Unique to Carbonate Rocks
1330 – 1420	Software Tools for Carbonate Reservoir Modeling: Review of Specialized Software Tools Used for Carbonate Reservoir Characterization & Modeling
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4

0730 – 0830	Fractured Carbonate Reservoirs: Characterization & Modeling of Natural Fractures in Carbonate Reservoirs & their Impact on Reservoir Performance
0830 – 0930	Carbonate Reservoir Enhancement Techniques: Overview of Reservoir Enhancement Techniques, including Acid Stimulation & Hydraulic Fracturing, Tailored for Carbonates
0930 – 0945	Break
0945 – 1100	Unconventional Carbonate Reservoirs: Exploration of Unconventional Carbonate Plays, including Tight Carbonates & Carbonate Mudstones
1100 – 1215	Enhanced Oil Recovery (EOR) in Carbonate Reservoirs: Discussion on EOR Methods Suitable for Carbonate Reservoirs, such as CO2 Injection & Chemical EOR
1215 – 1230	Break
1230 – 1330	Challenges in Carbonate Reservoir Management: Identifying & Addressing the Unique Challenges in Managing Carbonate Reservoirs for Optimal Recovery
1330 – 1420	Recent Advances & Technologies: Exploration of Recent Technological Advances & Research Directions in Carbonate Reservoir Characterization & Modeling
1420 – 1430	Recap
1430	Lunch & End of Day Four

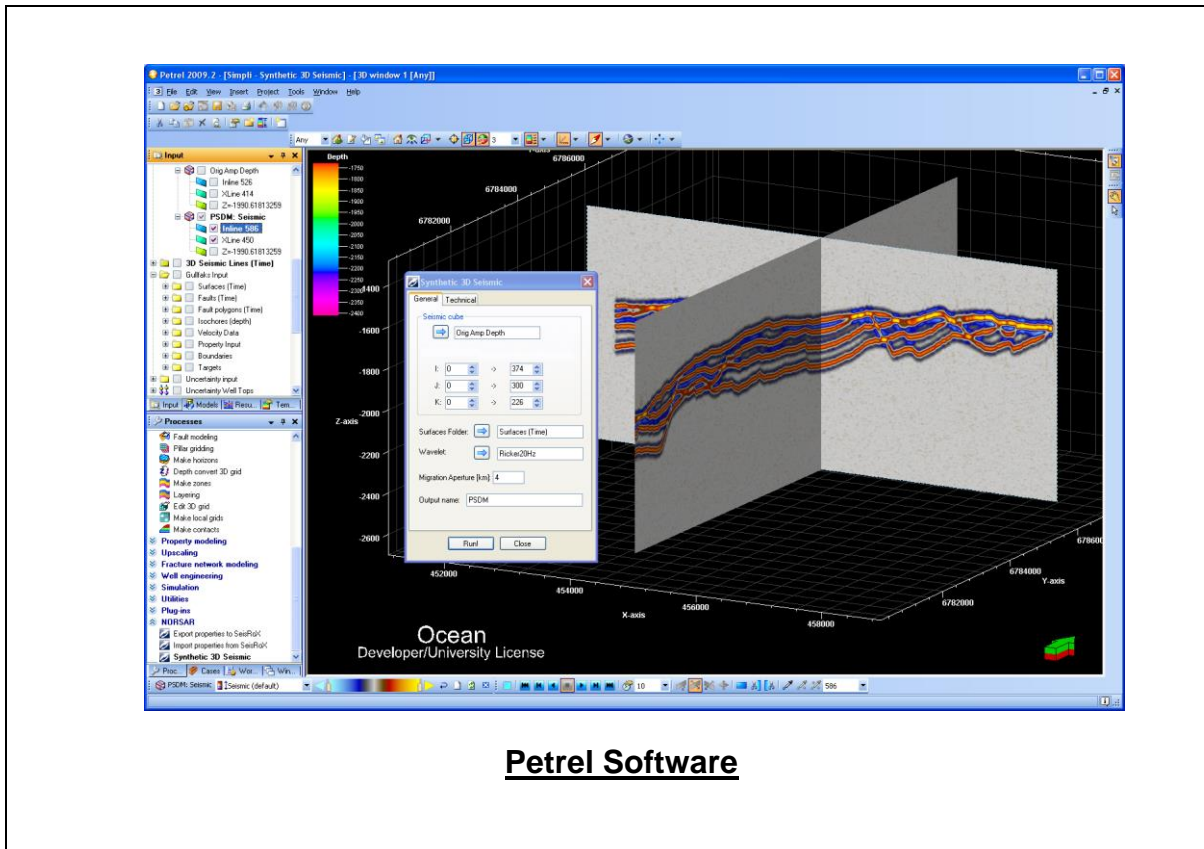
Day 5

0730 – 0830	Workflows for Integrated Carbonate Reservoir Study: Presentation of Step-by-Step Workflows for Conducting Integrated Reservoir Studies in Carbonates
0830 – 0930	Carbonate Reservoir Field Development Planning: Strategies for Field Development Planning & Management Based on Carbonate Reservoir Characterization & Modeling
0930 – 0945	Break
0945 – 1100	Uncertainty Analysis & Risk Assessment: Methods for Conducting Uncertainty Analysis & Risk Assessment in Carbonate Reservoir Projects
1100 – 1230	Digital Rock Physics & Carbonates: Introduction to Digital Rock Physics Techniques for Enhancing Carbonate Reservoir Characterization

1230 – 1245	Break
1245 – 1345	<i>Interactive Workshop on Carbonate Reservoir Modeling: Participants Engage in a Hands-on Workshop to Apply the Concepts Learned Throughout the Course on a Real-World Carbonate Reservoir Modeling Project</i>
1345 – 1400	Course Conclusion
1400 – 1415	POST-TEST
1415 – 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch & End of Course</i>

Simulator (Hands-on Practical Sessions)

Practical sessions 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 “Petrel” software.



Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org