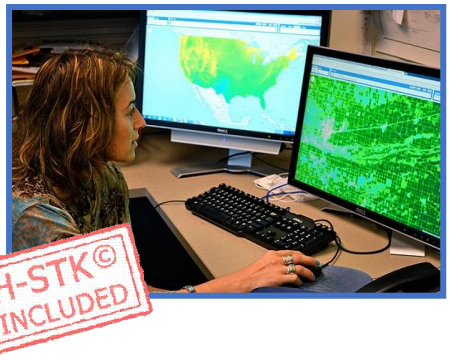
COURSE OVERVIEW DE0087-4D

Fractured Reservoir Characterization with Emphasis on Carbonates

Course Title

Fractured Reservoir Characterization with Emphasis on Carbonates



Course Date/Venue

November 18-21, 2024/Al Aziziya Hall, The Proud Hotel Al Khobar, Al Khobar, KSA

2.4 CEUs (24 PDHs) AWARD

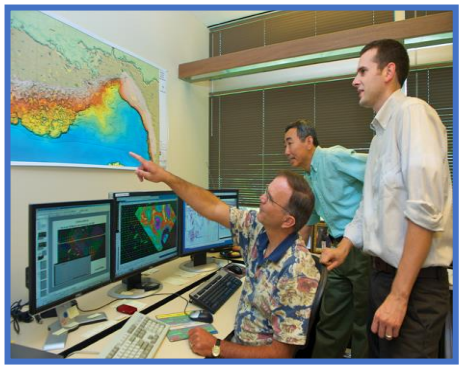
Course Reference

DE0087-4D

Course Duration/Credits

Four days/2.4 CEUs/2.4 PDHs

Course Description



This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

More than fifty percent of the petroleum reservoirs are in carbonate rocks. In the Middle East, it is estimated that this number increases to seventy percent. A great number of these reservoirs are naturally fractured, e.g., Ghawar field, in Saudi Arabia, Cantarell field in Mexico and Yates field in the USA. These are three of the largest fields in the world. The interest in such fields has grown tremendously.

The presence of extensive networks of natural fractures creates a number of challenges for evaluating and optimising recovery from naturally fractured reservoirs. The use of dual porosity or dual permeability models is often necessary, providing the basis for both analytical methods (such as used for pressure transient analysis) as well as for reservoir simulation. Appropriate application of dual porosity and dual permeability models, however, rely on: a) accurate representation of the fracture system as an equivalent porous and permeable medium, and b) accurate determination of the rates of fluid transport between matrix blocks and the fracture system.

This course is designed to provide different approaches for evaluation and characterization of heterogeneous naturally fractured carbonate reservoirs by wire-line log, core analysis and well testing. Different methods for modelling and dynamic simulation of naturally fractured reservoirs and case histories will be reviewed including multiple porosity model with structured grids and single porosity with unstructured grids. Production data analysis of unconventional reservoirs will also be reviewed.

The course covers the fractured reservoirs, learn how to recognize and evaluate natural fractured reservoir; the overall effect of natural fractures on subsurface fluid-flow; the techniques that employ outcrop and subsurface rock data; the methods for controlling short-term and long-term performance in fractured reservoirs; the various types of data necessary to evaluate and manage them; and the geologic aspects, origin and classification of fractured reservoirs.

During this interactive course, participants will learn the geologic aspects and petrophysics properties of carbonate rock; the overall effect of natural fractures on subsurface fluid-flow; the reservoir characterization principals and techniques that employ outcrop and subsurface rock data; the types of data necessary to characterize the natural fracture reservoir and the modelling work flow; the fracture reservoir characterizing model can be constructed emphazing on carbonate; the methods for controlling short-term and long-term performance in fractured reservoirs; and the geologic aspects, petrophysics and rock properties.

Course Objectives

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

- Apply and gain an in-depth knowledge on fractured reservoir characterization with emphasis on carbonates
- Classify fractured reservoirs, learn how to recognize and evaluate natural fractured reservoir
- Predict the overall effect of natural fractures on subsurface fluid-flow
- Illustrate techniques that employ outcrop and subsurface rock data
- Carryout methods for controlling short-term and long-term performance in fractured reservoirs
- Identify the various types of data necessary to evaluate and manage them
- Discuss the geologic aspects, origin and classification of fractured reservoirs
- Discuss the geologic aspects and petrophysics properties of carbonate rock.
- Predicting the overall effect of natural fractures on subsurface fluid-flow
- Learn how to recognize and evaluate natural fractured reservoir.
- Discuss the reservoir characterization principals and techniques that employ outcrop and subsurface rock data.
- Discuss the types of data necessary to characterize the natural fracture reservoir and the modelling work flow.
- Discuss how fracture reservoir characterizing model can be constructed emphazing on carbonate

- Explain methods for controlling short-term and long-term performance in fractured reservoirs.
- Discuss the geologic aspects, petrophysics and rock properties

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, sample video clips of the instructor's actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of fractured reservoir characterization with emphasis on carbonates for geologists, petrophysicists, geophysicists and reservoir engineers involved in the development and management of fractured carbonate reservoirs.

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$ 6,750 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: -

- 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 **2.4 CEUs** (Continuing Education Units) or **24 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 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. Stan Constantino, MSc, BSc, is a **Senior Petroleum & Reservoir Engineer** with over **35 years** of **Offshore & Onshore** extensive experience within the **Oil, Gas & Petroleum** industries**.** His area of expertise include **Reserves & Resources**, **Reserves Estimation & Uncertainty**, **Reservoir** Characterization, **Unconventiona**l **Resource & Reserves** Evaluation, **Oil & Gas Reserves** Estimation, Methods for **Aggregation of Reserves & Resources**, **Fractured Reservoir** Classification & Evaluation**, Petrophysics & Rock** Properties**, Seismic** Technology**, Geological** Modelling, **Water Saturation**, **Crude Oil & Natural Gas** Demand, **Exploration Agreements & Financial** Modelling, **Seismic Survey** Evaluation, **Exploration Well** Identification, **Field Production** Operation, **Field Development** Evaluation, Crude Oil Marketing, **Core & Log Data** Integration, **Core Logging**, Advanced **Core & Log Integration**, **Well Logs & Core Analysis**, Advanced Petrophysics/Interpretation of **Cased Hole Logs**, **Cased Hole Formation Evaluation**, **Cased Hole Formation** Evaluation, **Cased Hole Evaluation**, **Cased-Hole Logging**, Applied **Production Logging & Cased Hole & Production Log** Evaluation, **Cased Hole Logging & Formation** Evaluation, Open & Cased Hole Logging, Screening of Oil Reservoirs for **Enhanced Oil Recovery**, **Enhanced Oil Recovery**, **Enhanced Oil Recovery** Techniques, **Petroleum Economic** Analysis, **Oil Industry** Orientation, **Oil Production & Refining**, **Crude Oil Market**, **Global Oil Supply & Demand**, **Global Oil Reserves**, **Crude Oil** Types & Specifications, **Oil Processing**, **Oil Transportation-Methods**, **Oil & Gas** Exploration and Methods, **Oil & Gas** Extraction, Technology Usage in Industrial Security; **Upstream**, **Midstream** & **Downstream Operations**; **Oil Reservoir** Evaluation & Estimation, **Oil Supply & Demand**, **Oil Contracts**, **Government Legislation & Oil Contractual Agreements**, **Oil Projects** & Their Feasibility (revenue and profitability), **Water Flooding**, **Reservoir** Souring & Water Breakthrough, **Reservoir Performance** Using Classical Methods, **Fractured Reservoir** Evaluation & Management, **Reservoir Surveillance** & Management, **Reservoir Engineering** & Simulation, **Reservoir Monitoring**, **Pressure Transient** Testing & **Reservoir** Performance Evaluation, **Reservoir** Characterization, **Reservoir** Engineering Applications with ESP and Heavy Oil, **Reservoir** Volumetrics, Water Drive Reservoir, **Reserve** Evaluation, Rock & Fluid Properties, Fluid Flow Mechanics, PVT Analysis, Material Balance, Darcy's Law & Applications, Radial Flow, **Gas Well** Testing, Natural Water Influx, EOR Methods, Directional Drilling, **Drilling** Production & Operations, Field Development & Production of Oil & Gas, **Wireline Logging**, **Mud Logging**, **Cased Hole Logging**, **Production Logging**, **Slick Line**, **Coil Tubing**, Exploration Wells Evaluation, **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** and **Petrophysical Log Analysis**. Currently, he is the **CEO** & **Managing Director** of **Geo Resources Technology** wherein he is responsible in managing the services and providing technical supports to underground energy related projects concerning **field development**, **production**, **drilling**, **reservoir engineering** and **simulation**.

Throughout his long career life, Mr. Stan has worked for many international companies such as the **Kavala Oil**, **North Aegean Petroleum Company** and **Texaco Inc.**, as the **Managing Director**, **Operations Manager**, **Technical Trainer**, **Training Consultant**, **Petroleum Engineering & Exploration Department Head**, **Assistant Chief Petroleum Engineer**, **Reservoir Engineer, Resident Petroleum Engineer**, **Senior Petroleum Engineer** and **Petroleum Engineer** wherein he has been managing the evaluation of exploration wells, reservoir simulation, development training, production monitoring, wireline logging and well testing including selection and field application of well completion methods.

Mr. Stan has a **Master's** degree in **Petroleum Engineering** and a **Bachelor's** degree in **Geology** from the **New Mexico Institute of Mining & Technology** (**USA**) and from the **Aristotelian University** (**Greece**) respectively. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership of Management (ILM**) and a member of the Society of Petroleum Engineers, USA (**SPE**), Society of Well Log Professional Analysts, USA (**SPWLA**) and European Association of Petroleum Geoscientists & Engineers (**EAGE**). Moreover, Mr. Stan published numerous scientific and technical papers and delivered various trainings, courses and workshops 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: ***Monday, 18th November 2024***

0730 – 0800	*Registration & Coffee*
0800 - 0815	*Welcome & Introductions*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Fracture Reservoir*** *Definition ● Origin*
0930 – 0945	*Break*
0945 – 1100	***Fracture Reservoir (cont'd)*** *Classification ● Character*
1100 – 1200	***Hydrocarbon Reservoir Properties*** *Definition*
1200 – 1215	*Break*
1215 – 1420	***Hydrocarbon Reservoir Properties (cont'd)*** *Petrophysical Characters ● Geological Aspects*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: ***Tuesday, 19th November 2024***

0730 – 0930	***Carbonate Rock*** *Definition ● Origin ● Classification*
0930 – 0945	*Break*
0945 – 1100	***Carbonate Rock (cont'd)*** *Geological Aspects ● Petrophysical Character*
1100 – 1200	***Reservoir Modeling*** *Definition ● Purpose*
1200 – 1215	*Break*
1215 – 1420	***Reservoir Modeling (cont'd)*** *Source of Information ● Workflow*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3: ***Wednesday, 20th November 2024***

0730 – 0930	***Natural Fracture Reservoir Modeling*** *Introduction*
0930 – 0945	*Break*
0945 – 1100	***Natural Fracture Reservoir Modeling (cont'd)*** *Indications of Presence of Fractures in Reservoir*
1100 – 1200	***Natural Fracture Reservoir Modeling (cont'd)*** *Application of Work Flow* *Surface Outcrops • Coring Analysis*
1200 – 1215	*Break*
1215 – 1350	***Natural Fracture Reservoir Modeling (cont'd)*** *Application of Work Flow (cont'd)* *Petrophysical Analysis • Coring & Petrophysical Analysis Integration*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4: ***Thursday, 21st November 2024***

0730 – 0930	***Natural Fracture Reservoir Modeling (cont'd)*** *Application of Work Flow (cont'd)* *Construction Petrophysical Modeling • Geophysical Technology • Construction Geological & Structure Modeling*
0930 – 0945	*Break*
0945 – 1100	***Natural Fractures in Field Development***
1100 – 1200	***Methods for Controlling Short-Term & Long-Term Performance in Fractured Reservoirs***
1200 – 1215	*Break*
1215 – 1330	***Case Studies***
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-

Course Coordinator

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