

COURSE OVERVIEW DE0521

Advances in Seismic Interpretation

Course Title

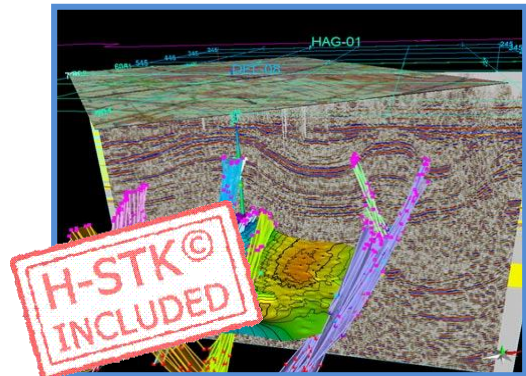
Advances in Seismic Interpretation

Course Reference

DE0521

Course Duration/Credits

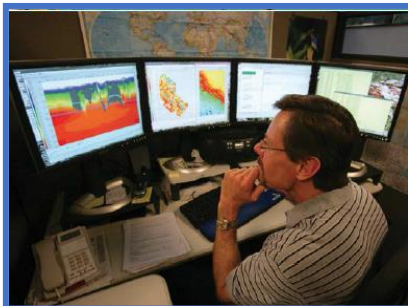
Five days/3.0 CEUs/30 PDHs



Course Date/Venue

Session(s)	Date	Venue
1	July 07-11, 2024	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE or, Online Virtual Training
2	August 19-23, 2024	Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE or, Online Virtual Training
3	September 08-12, 2024	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE or, Online Virtual Training
4	November 18-22, 2024	Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE or, Online Virtual Training

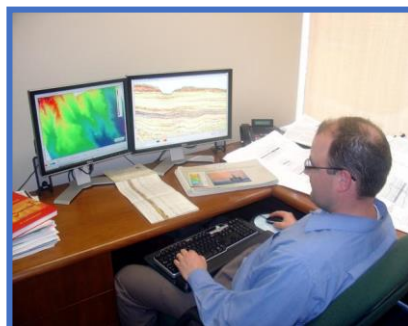
Course Description



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.



Creation of shareholder value should be at the heart every business decision. This course is geared towards explorationists who are involved in screening seismic data for possible leads that they develop into prospects. This is a hands-on course where the instructor spends as little time on lectures as possible and the bulk of the time is spent interpreting seismic lines. These lines have been collected from oil producing basins worldwide and provide textbook examples of structural and stratigraphic geometries.



The course is evenly divided between the seismic expression of structural styles and seismic stratigraphy. After spending minimal time on acquisition and background theory participants will be made acutely aware of impedance and resolution and identification of processing errors and how important it is to understand these before interpretation. The participants will be introduced to the structural complexity associated with fold and thrust terrains, extensional systems and various types of wrench faulting and salt/mud related deformation.

The seismic stratigraphy portion of the course not only covers the practice of sequence stratigraphy using seismic data (AAPG Memoir 26), but also spends quite a bit of time on seismic facies analysis in cross-sectional view. Through lots of exercises by the end of the course everyone should be proficient at sequence analysis on seismic lines and be able to interpret depositional environments and net:gross using seismic facies analysis. The course will also introduce participants to the world of seismic geomorphology, attribute analysis and direct hydrocarbon indicators with an emphasis on unconventional resource plays such as fractured shale gas reservoirs and tight-gas sandstones.

Participants are strongly urged to bring paper copies of their own seismic data to work on. These data will not be shared with anyone and will only be reviewed by the instructor.

Course Objectives

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

- Apply and gain an in-depth knowledge on seismic interpretation
- Discuss the seismic methodology of seismic interpretation, seismic acquisition and processing, seismic frequency and its relationship to bed thickness, impedance, detection and resolution
- Calculate seismic frequency and resolution as well as recognize the belts compressional tectonics, fold and thrust belts
- Interpret fold and thrust belts and explain the extensional systems
- Interpret rifts, strike-slip and oblique slip systems and identify the wrench faults, flower structures, salt tectonics and shale diapirism
- Illustrate seismic sequence stratigraphy covering the principles of accommodation, relative sea-level cycle, systems tracts, reflection terminations and the identification of key surfaces on seismic data
- Perform sequence analysis on seismic lines
- Analyze seismic facies for external geometries and internal reflection configuration, the ABC method of defining seismic facies, reflection patterns, continuity and amplitude to determine environments of deposition and net gross
- Determine the horizon slices, stratal and the advantages/disadvantages of each including common seismic attributes direct application to unconventional resource plays such as tight-gas sandstones and fractured shale plays
- Recognize the different delivery system that includes direct hydrocarbon indicators like flat spots, bright spots and polarity reversals

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 seismic interpretation for geoscientists, geologists, geophysicists that spend most of their time interpreting seismic data on the workstation. Whether you are an early career geoscientist wanting to learn a systematic approach to seismic interpretation or an experienced professional wanting to learn some of the latest techniques to have emerged in structural geology and seismic stratigraphy, this is the course for you.

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

Virtual Training (If Applicable)

If this course is delivered online as a Virtual Training, the following limitations will be applicable:-

Certificates	Only soft copy certificates will be issued to participants through Haward’s Portal. This includes Wallet Card Certificates if applicable
Training Materials	Only soft copy Training Materials (PDF format) will be issued to participant through the Virtual Training Platform
Training Methodology	80% of the program will be theory and 20% will be practical sessions, exercises, case studies, simulators or videos
Training Program	The training will be for 4 hours per day starting at 0930 and ending at 1330
H-STK Smart Training Kit	Not Applicable
Hands-on Practical Workshops	Not Applicable
Site Visit	Not Applicable
Simulators	Only software simulators will be used in the virtual courses. Hardware simulators are not applicable and will not be used in Virtual Training

Course Fee

F2F Classroom: 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.


Online Virtual: US\$ 4,000 per Delegate + **VAT**.

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: -


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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.

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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.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Instructor(s)

This course will be conducted by the following instructor. However, we have the right to change the course instructor 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 Seismic Interpretation, Seismic Survey Evaluation, Seismic Technology, Seismic Facies Analysis, Reserves & Resources, Reserves Estimation & Uncertainty, Reservoir Characterization, Unconventional Resource & Reserves Evaluation, Oil & Gas Reserves Estimation, Methods for Aggregation of Reserves & Resources, Fractured Reservoir Classification & Evaluation, Sequence Stratigraphy, Petrophysics & Rock Properties, Geological Modelling, Water Saturation, Crude Oil & Natural Gas Demand, Exploration Agreements & Financial Modelling, 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

0730 – 0800	<i>Registration & Coffee</i>
0800 - 0815	<i>Welcome & Introduction</i>
0815 – 0830	PRE-TEST
0830 – 0930	<i>Introduction to Seismic Acquisition & Processing, Seismic Frequency & its Relationship to Bed Thickness, Impedance, Detection & Resolution</i> <i>The Systematic Methodology of Seismic Interpretation</i>
0930 – 0945	<i>Break</i>
0945 – 1100	<i>Exercise on Calculating Seismic Frequency & Resolution</i>
1100 - 1230	<i>Compressional Tectonics & Fold & Thrust Belts</i> <i>Horses, Piggy-Back Thrusting, Duplexes & Antiformal Stacks, Triangle-Zones, Fault Propagation Folds, Fault Bend Folds & Detachment Folds</i>
1230 - 1245	<i>Break</i>
1245 - 1420	<i>Exercises on Interpretation of Fold & Thrust Belts</i>
1420 – 1430	Recap
1430	<i>End of Day One</i>

Day 2

0730 – 0930	<i>Extensional Systems</i> <i>Planar & Listric Normal Faults, Relay Ramps, Rollover Anticlines</i>
0930 – 0945	<i>Break</i>
0945 – 1100	<i>Extensional Systems (cont'd)</i> <i>Antithetic & Synthetic Faults, Inversion Structures, Salt & Mud Diapirism Related Deformation</i>
1100 – 1230	<i>Exercises on Interpretation of Rifts, Strike-Slip & Oblique Slip Systems</i>
1230 – 1245	<i>Break</i>
1245 - 1420	<i>Introduction to Wrench Faults, Flower Structures, Salt Tectonics & Shale Diapirism</i>
1420 – 1430	Recap
1430	<i>End of Day Two</i>

Day 3

0730 – 0930	<i>Seismic Sequence Stratigraphy</i> <i>Principles of Accommodation</i>
0930 – 0945	<i>Break</i>
0945 – 1100	<i>Seismic Sequence Stratigraphy: (cont'd)</i> <i>Relative Sea-Level Cycle, Systems Tracts</i>
1100 – 1230	<i>Seismic Sequence Stratigraphy: (cont'd)</i> <i>Reflection Terminations & the Identification of Key Surfaces on Seismic Data</i>
1230 – 1245	<i>Break</i>
1245 - 1420	<i>Exercises on Performing Sequence Analysis on Seismic Lines</i>
1420 – 1430	Recap
1430	<i>End of Day Three</i>

Day 4

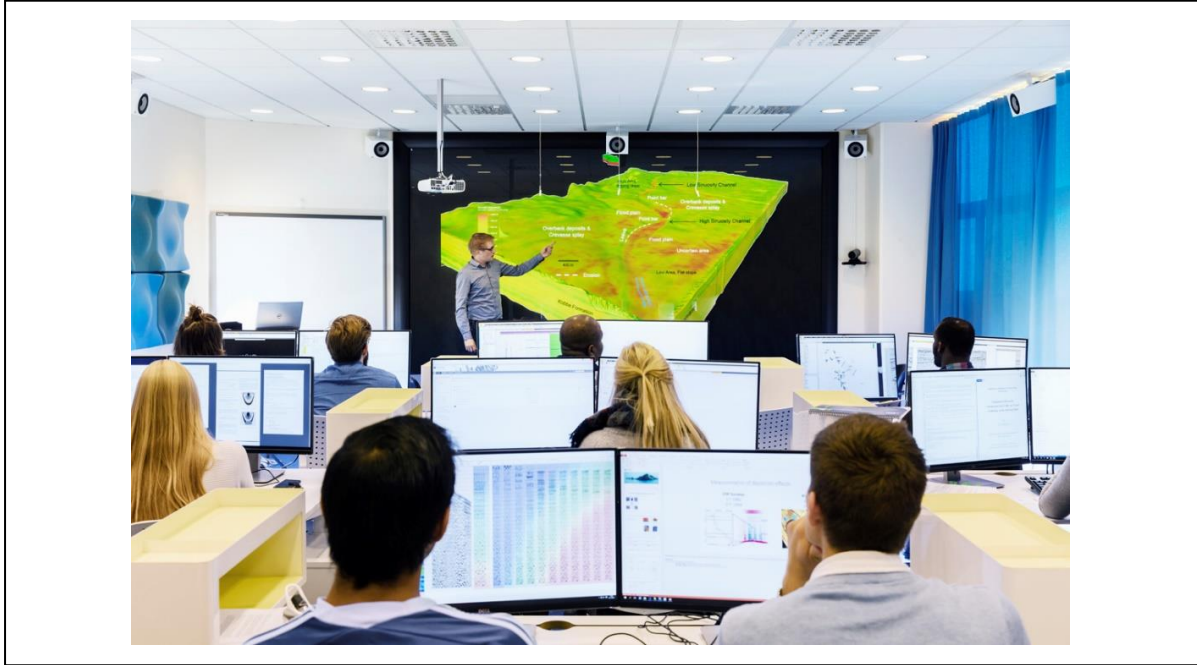
0730 – 0930	Seismic Facies Analysis <i>External Geometries & Internal Reflection Configuration</i>
0930 – 0945	Break
0945 – 1100	Seismic Facies Analysis (cont'd) <i>The ABC Method of Defining Seismic Facies</i>
1100 – 1230	Seismic Facies Analysis (cont'd) <i>Reflection Patterns, Continuity & Amplitude & Using these to Determine Environments of Deposition & Net: Gross</i>
1230 – 1245	Break
1245 - 1420	Exercises on Seismic Facies Analysis
1420 – 1430	Recap
1430	<i>End of Day Four</i>

Day 5

0730 – 0930	Time Slices <i>Horizon Slices & Stratal & the Advantages/Disadvantages of Each</i>
0930 – 0945	Break
0945 -1100	Time Slices (cont'd) <i>Common Seismic Attributes Direct Application to Unconventional Resource Plays Such as Tight-Gas Sandstones & Fractured Shale Plays</i>
1100 – 1230	Recognizing the Different Delivery System <i>Direct Hydrocarbon Indicators Such as Flat Spots, Bright Spots & Polarity Reversals</i>
1230 – 1245	Break
1245 - 1345	Workshop on Participant Data
1345 – 1400	Course Conclusion
1400 – 1415	POST- TEST
1415 – 1430	<i>Presentation of Course Certificates</i>
1430	<i>End of Course</i>

Practical Sessions

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



Course Coordinator

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