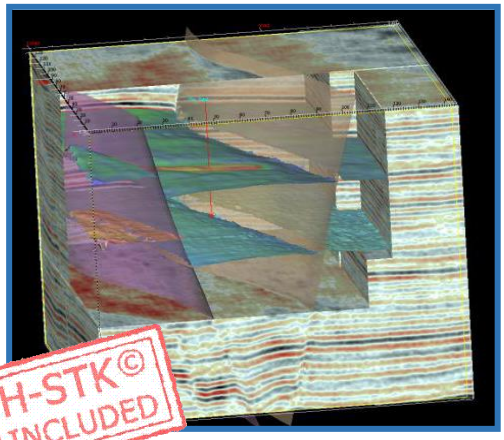
COURSE OVERVIEW DE0580
2D and 3D Seismic Interpretation



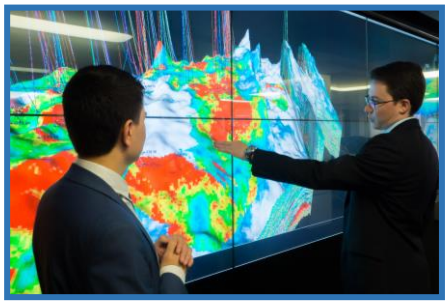
Course Title
2D and 3D Seismic Interpretation

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

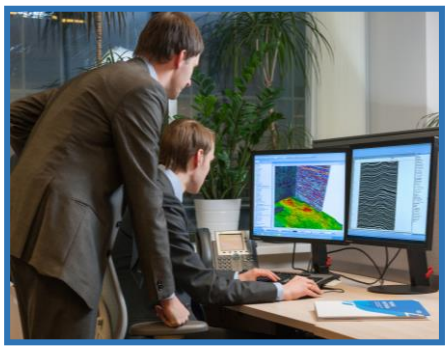
Course Reference
DE0580

Course Duration/Credits
Five days/3.0 CEUs/30.0 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.



Seismic acquisition processing, imaging, interpretation and extraction of geological and petrophysical information. Data examples, exercises, and workshops are used to illustrate key concepts, practical issues, and pitfalls as they affect the interpretation and integration of seismic data and information into E&P workflows.

Practical aspects of seismic interpretation are covered with examples that involve the distinct aspects of geological and tectonic provinces relative to their hydrocarbon potential. Interpretation workshops build understanding of the main techniques in seismic interpretation and in structural contour mapping. Special emphasis is given to hand contouring map interpretation comparisons with modern workstation interpretation mapping for 2D and 3D data sets.

This course is designed to provide participants with a detailed and up-to-date overview of advanced seismic data acquisition and processing. It covers the role of seismic in reservoir life cycle; the types of seismic methods; the principles of seismic wave propagation; and the principles of seismic reflection and signal processing tools.

During this interactive course, participants will learn the effect of acquisition on interpretation, spatial sampling and aliasing; the noise types and how to attenuate noise in the field; the 3D survey parameters and design, acquisition systems & operations; the special issues and techniques of data interpretation and AVO analysis; the concept of quality assurance & business/cost overview, data processing flows and pre-stack analysis and signal corrections; sorting, gain, phase, deconvolution, velocity filtering and multiple attenuation; the velocity, velocity analysis and statics; the difference between filed statics and weathering corrections; the refraction and reflection based statics; the concept of time, prestack, depth migrations, prestack depth workflow, velocity model building and iteration; the processing pitfalls and quality assurance, seismic inversion and wavelet processing; the principles of AVO, rock physics, attributes, frequency and phase; the coherency and multi-component methods; the time lapse (4D) techniques; the subsurface integration for reservoir characterization; and the seismic acquisition, processing and interpretation.

Course Objectives

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

- Apply and gain an advanced knowledge on seismic acquisition and processing
- Recognize the role of seismic in reservoir life cycle
- Identify the types of seismic methods and the principles of seismic wave propagation
- Apply the principles of seismic reflection and signal processing tools
- Determine the effect of acquisition on interpretation, spatial sampling and aliasing
- Identify the noise types and how to attenuate noise in the field
- Discuss the 3D survey parameters and design, acquisition systems & operations as well as the special issues and techniques of data interpretation and AVO analysis
- Enumerate the concept of quality assurance & business/cost overview, data processing flows and pre-stack analysis and signal corrections
- Describe sorting, gain, phase, deconvolution, velocity filtering and multiple attenuation and discuss velocity, velocity analysis and statics
- Explain the difference between filed statics and weathering corrections and discuss refraction and reflection based statics
- Recognize the concept of time, prestack, depth migrations, prestack depth workflow and velocity model building and iteration
- Develop the processing pitfalls and quality assurance as well as seismic inversion and wavelet processing
- Apply the principles of AVO, rock physics, attributes, frequency and phase and explain coherency and multi-component methods
- Use time lapse (4D) techniques and discuss subsurface integration for reservoir characterization
- Review seismic acquisition, processing and interpretation

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 3D seismic horizon and fault interpretation for geoscienptists and engineers.

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.

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 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:

Ms. Diana Helmy, PgDip, MSc, BSc, is a **Senior Petroleum & Geologist** with extensive years of experience within the **Oil & Gas**, **Refinery** and **Petrochemical** industries. Her expertise widely covers in the areas of **Oil & Gas Analytics**, **Petrophysics & Reservoir Engineering**, **Subsurface Geology & Logging** Interpretation, **Petroleum Geology**, **Geophysics**, **Seismic** Processing & Exploration, **Seismic** Interpretation, **Sedimentology**, **Stratigraphy & Biostratigraphy**, **Petroleum Economy**, **Core** Analysis, Well Logging Interpretation, **Core Lab Analysis** & **SCAL**, **Sedimentary Rocks**, **Rock** Types, Core & Ditch Cuttings Analysis, Clastic, Carbonate & Basement Rocks, **Stratigraphic Sequences**, **Petrographically** Analysis, Thin Section Analysis, Scanning Electron Microscope (**SEM**), X-ray Diffraction (**XRD**), Cross-Section Tomography (**CT**), **Conventional & Unconventional** Analysis, **Porosity & Permeability**, **Geological & Geophysical** Model, **Sedimentary** Facies, **Formation Damage** Studies & Analysis, **Rig** Awareness, 2D&3D **Seismic** Data Processing, Static & Dynamic Correction, Noise Attenuation & Multiple Elimination Techniques, Velocity Analysis & Modeling and various software such as Petrel, OMEGA, LINUX, Kingdom ad Vista.

During her career life, Ms. Diana worked as a **Technical Sales & Marketing Manager**, **Reservoir Geologist**, **Seismic Engineer**, **Geology Instructor**, **Geoscience Instructor & Consultant** and **Petroleum Geology Researcher** from various international companies like the **Schlumberger**, Corex Services for Petroleum Services, Petrolia Energy Supplies and Alexandria University.

Ms. Diana has a **Postgraduate Diploma** in **Geophysics**, **Master** degrees in **Petroleum Geology** and **Geophysics** and a **Bachelor** degree in **Geology**. Further, she is a **Certified Instructor & Trainer** and has delivered numerous trainings, courses, workshops, 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 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	***Role of Seismic in Reservoir Life Cycle***
0930 – 0945	*Break*

0945 – 1040	***Types of Seismic Methods***
1040 – 1135	***Principles of Seismic Wave Propagation*** *Ray and Wavefronts • Snell's Law • Reflection • Refraction & Critical Angle • Amplitude Behaviour*
1135 - 1230	***Seismic Reflection Principles*** *Acoustic Impedence • Seismic Resolution • Factor Affecting Wave Propagation*
1230 – 1245	*Break*
1245 – 1335	***Signal Processing Tools***
1335 - 1420	***Effect of Acquisition on Interpretation, Spatial Sampling & Aliasing***
1420 – 1430	***Recap***
1430	*End of Day One*

Day 2

0730 – 0830	***Noise Types & How to Attenuate Noise in the Field***
0830 - 0930	***3D Survey Parameters & Design***
0930 – 0945	*Break*
0945 – 1040	***Acquisition Systems & Operations***
1040 – 1135	***Special Issues & Techniques***
1135 - 1230	***Quality Assurance & Business/Cost Overview***
1230 – 1245	*Break*
1245 – 1335	***Data Processing Flows***
1335 - 1420	***Pre-Stack Analysis & Signal Corrections***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Sorting, Gain, Phase, Deconvolution, Velocity Filtering & Multiple Attenuation***
0830 - 0930	***Velocity, Velocity Analysis & Statics***
0930 – 0945	*Break*
0945 – 1040	***Field Statics & Weathering Corrections*** *Short Period vs. Long Period*
1040 – 1135	***Refraction & Reflection Based Statics***
1135 - 1230	***Time, Prestack, Depth Migrations***
1230 – 1245	*Break*
1245 – 1335	***Prestack Depth Workflow***
1335 - 1420	***Velocity Model Building & Iteration***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Processing Pitfalls & Quality Assurance***
0830 - 0930	***Seismic Inversion & Wavelet Processing***
0930 – 0945	*Break*
0945 – 1040	***AVO Principles, Rock Physics, Attributes, Frequency & Phase***
1040 – 1135	***Coherency & Multi-Component Methods***
1135 - 1230	***Time Lapse (4D) Techniques***
1230 – 1245	*Break*
1245 – 1335	***Subsurface Integration for Reservoir Characterization***
1335 - 1420	***Mapping Exercise # 1 :*** *Base High • Mapping Techniques – Discussion • Map Contouring*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0930	***Mapping Exercise # 2 :*** *Carbonate Build-up • Seismic Velocities • Depth Conversion Techniques*
0930 – 0945	*Break*
0945 – 1025	***Review of Seismic Acquisition, Processing & Interpretation***
1025 – 1105	***Comparative Interpretation of Post-Stack & Pre-Stack Time Migration***
1105 – 1145	***Pre-Stack Depth Migration - Interpretation***
1145 – 1230	***Mapping Exercise # 3 :*** *Rift Basin • Mapping Techniques Precision • Map Contouring – Block Faulting • Gravity & Magnetic Mapping • Seismic Velocities & Well Velocities • Wells Location Precision • Depths Maps Prescision*
1230 – 1245	*Break*
1245 - 1345	***Mapping Exercise # 4 :*** *Compressional Tectonics • Fault Contouring • Discussion of Mapping Techniques • Velocities • Wells Location • Depth Map Construction*
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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