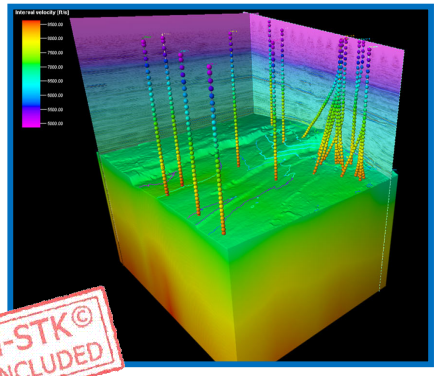
COURSE OVERVIEW DE0121
Seismic Velocities and Depth Conversion – SVDC

Course Title
Seismic Velocities and Depth Conversion – SVDC

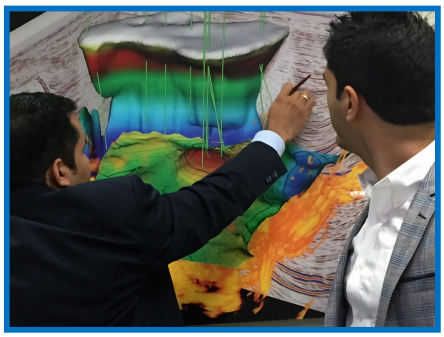


Course Date/Venue
Session 1: June 15-19, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
Session 2: November 03-07, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
DE0121

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

Creation of shareholder value should be at the heart every business decision. This course is designed for technical professionals in the petroleum industry who want to understand the nature of *Seismic Data* as it is acquired in time - the time taken for the sound to travel from the source to reflectors and to return to receivers. However, wells are drilled in depth, not time. Variations in velocity can distort the depth, size, and shape of possible reservoirs. Therefore, conversion from time to depth is needed for a clear picture of the prospect and the risks involved.

This course will teach you how to use velocity information and structural inputs to build a consistent velocity model and/or calibrate ones that have been created during seismic data processing.In the last decade or two, large strides have been made in seismic processing, especially in PreStack Depth Migration. Routinely used advanced migration algorithms now require more accurate velocity models.

Better tools have been developed to ascertain the velocity, and more time and effort are now spent in velocity analysis by the seismic processors. This has greatly improved current velocity models. The interpreter, however, still needs to know how the models are made, how to quality control them, and how to modify and correct them when needed. This class is designed for the interpreter so that he or she understands the theory and practice of how to estimate depths from older time-migrated data, as well as how to quality control (QC) and calibrate newer PSDM data. Also covered in this class are when to reprocess the data and how to communicate with the processor in order to produce the best velocity model and depth image.

As a foundation class, the instruction starts with the basics and proceeds to more complex topics. The student should have a basic understanding of geophysics such as offered in any basic geophysics course. Little advanced math (calculus) is used, but algebra and lots of diagrams are applied to explain the needed concepts. One personal computer will be provided, for each two participants. Each section of the course is supported with in-class exercises included on a USB flash drive (given to each participant) that contains the exercises and all needed data and software.

Course Objectives

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

- Apply and gain an in-depth knowledge on seismic velocities and depth conversion (SVDC)
- Define and compare many types of velocity including average, interval, RMS, stacking, migration, P-wave and S-wave
- Study the velocity inputs covering the accuracy and regional extent of each
- Analyze VSPs and sonic logs that includes time-depth functions, well picks and pseudo velocities, seismic velocities and horizons for structural control
- Evaluate synthetic seismograms and explain advanced synthetics
- Match synthetics to seismic and calibrate seismic data to the well data
- Identify seismic velocities that covers semblance analysis, velocity picking and multiples and evaluate how seismic velocities differ from well-velocities
- Illustrate migration and migration velocities and velocity model building
- Analyze time-depth curves and well picks associated with seismic horizons and structure from horizons
- Discuss time-to-depth conversions covering vertical stretch, inverse raytracing, thru migration and uncertainty

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 is designed for early-career geoscientists and engineers, especially seismic interpreters, and anyone who needs to understand the basic theory and procedures for creating velocity models and converting seismic data from time to depth. Although, this is a foundation level course. It would be beneficial for even the experienced velocity modeler or processor.

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. Ron Guney, MSc, BSc, is a **Senior Geophysicist** with over **30 years** of **Offshore & Onshore** experience within the **Oil**, **Gas**, **Refinery** and **Petrochemical** industries. His expertise widely covers **Geophysics**, **Geophysical** Technology, **Borehole Geophysics**, **Seismology**, **Wave** Propagation & Velocities, **Seismic Acquisition** Techniques, **Seismic Data** Processing, **Vertical Seismic Profiling** (**VSP**), **Seismic Data** Interpretation, **Geomodelling**, Prospect Generation-Delineation & **Reservoir** Modelling, **Static** Modelling, Prospect Generation through **Seismic Structural & Stratigraphic** Interpretation, **Play Assessment & Prospect Evaluation**, **Prospect-Play Risk** Assessment & Ranking, **Resource & Reserve Estimations**, **Post Stack Seismic Attribute** Analysis, **Post Stack Seismic** Inversion, Traveltime Inversion, **Crossborehole Seismic Tomography**, **Seismic Sequence Stratigraphy**, Program Coding (**VSP & Cross-borehole** Travel Time Inversion ART and SIRT), **Post Drill Well Assessment**, **Field** Development, **Seismostratigraphy**, **Seismotectonics & Geodynamics** & Modelling, Cartographic Information Systems (**CIS**), Geographic Information Systems (**GIS**), **Geodesy & Topography**, **Geodesy**, **Map Projections** & Coordinate Systems, Geological Maps (**GM**), **Topographic & Geologic Maps**, Cartography Assisted by Computer (**CAC**), Global Positional System (**GPS**), **Petroleum Geology**, **Advanced Petrophysics**, **Petroleum Exploration**, **Petroleum Economics**, **Drilling**, **Core-to-Log Data Integration** (**SCAL**), **Basin Modelling** & **Total Petroleum System** (**TPS**), **Well Logging**, **Formation Evaluation**, **Well Testing & Data** Interpretation, **Pore Pressure Prediction** and **Oil & Gas Reserves** Estimations. He is also an expert in **2D & 3D Seismic Interpretation Oil Risk** Analysis, **Landmark**, **Zmap+ Mapping** Package, **Petrel** Schlumberger, **Promax** Processing System and 3D Seismic Data Acquisition. Currently, he is the **Senior Geophysicist Consultant** of Eastern Offshore Black Sea E&P Projects.

During his long career, Mr. Guney has gained his practical and field experience through his various significant positions and dedication as the **Senior Geophysicist Consultant**, **Senior Geophysicist**, **Senior Project Geophysicist**, **Teaching Assistant**, **Lecturer**, **Instructor/Trainer** from numerous international companies such as the Eastprime Service Co., Emirates National Oil Company (ENOC) - Dragon Oil, OMV Petrol and Turkish Petroleum Corp, just to name a few.

Mr. Guney has a **Master's** degree in **Geology** from the **University of New Orleans**, **USA** and a **Bachelor's** degree in **Geophysics** from the Istanbul Technical University. Further, he is a **Certified Instructor/Trainer**, a **Certified Trainer/Assessor** by the **Institute of Leadership & Management** (**ILM**) and has **published books** and **scientific papers** such as Iterative Wavefront Reconstruction Technique (**IWR**), **Mathematical Geophysics**, **Model Optimisation in Exploration Geophysics**, **Importance of Seismic Interpretation Systems** and delivered various trainings, seminars, workshops, courses and conferences worldwide.

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 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	***Study of Velocity*** *Definition & Comparison of the Many Types of Velocity including Average, Interval, RMS, Stacking, Migration, P-Wave & S-Wave*
0930 – 0945	*Break*
0945 – 1100	***Study of Velocity Inputs*** *Accuracy & Regional Extent of each including Check Shots, VSPs, Sonic Logs, Time/Depth Functions, Well Picks & Pseudo Velocities, Seismic Velocities & Horizons for Structural Control*
1100 – 1230	***Analyses VSPs, Sonic Logs*** *Time/Depth Functions • Well Picks & Pseudo Velocities • Seismic Velocities & Horizons for Structural Control*
1230 – 1245	*Break*
1245 – 1420	***Exercises on Interpretation of Logs-Time/Depth Functions***
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0930	***Evaluate -Synthetic Seismograms*** *Creation • Upscaling • Tie to Seismic Data*
0930 – 0945	*Break*

0945 – 1100	***Advanced Synthetics*** *Synthetic Gather Creation • Zoeppritz Equations • AVA & AVO*
1100 – 1230	***Matching Synthetics to Seismic*** *Calibrating the Seismic Data to the Well Data*
1230 – 1245	*Break*
1245 – 1420	***Exercises on Synthetic Gather-Calibrating the Seismic Data to the Well Data***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Seismic Velocities*** *Semblance Analysis • Velocity Picking • Multiples*
0930 – 0945	*Break*
0945 – 1100	***Seismic Velocities (cont'd)*** *Evaluate how Seismic Velocities Differ from Well-Velocities*
1100 – 1230	***Migration & Migration Velocities*** *Introduction to Pre & Post-Stack*
1230 – 1245	*Break*
1245 – 1420	***Exercises on Algorithms, Tomography & Iterative Velocity Analysis***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0930	***Velocity Model Building*** *Workflows to Integrate Stacking Velocities*
0930 – 0945	*Break*
0945 – 1100	***Study of Time/Depth Curves***
1100 – 1230	***Analyses Well Picks Associated with Seismic Horizons (Pseudo-Velocities) & Structure from Horizons***
1230 – 1245	*Break*
1245 – 1420	***Exercises on Seismic Horizon Analysis***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0930	***Introduction to Time-to-Depth Conversions*** *Vertical Stretch • Inverse Raytracing*
0930 – 0945	*Break*
0945 – 1100	***Introduction to Time-to-Depth Conversions (cont'd)*** *Thru Migration & Uncertainty*
1100 – 1230	***Introduction to Advanced Topics*** *Anisotropy • Pore-Pressure Prediction • Geostatistics & Forward Modeling*
1230 – 1245	*Break*
1245 – 1345	***Workshop–Exercises on Participant Data***
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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