

**COURSE OVERVIEW DE0740**  
**Structural Geology & Tectonics**

**Course Title**

Structural Geology & Tectonics

**Course Date/Venue**

Session 1: July 14-18, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE  
 Session 2: December 21-25, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE



**Course Reference**

DE0740



**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.***



This course is designed to provide delegates with a detailed and up-to-date overview of structural geology and tectonics. It covers the basic revision of stress/strain and the mechanisms of fracture; the faulting and folding, fault terminology and formation of extensional basins; the stretching models for rift basins and continental margins including isostasy and flexure and thermal effect lithospheric stretching; the back stripping techniques, fault geometry and displacement patterns; and the fault shapes, fault-displacement contouring, fault growth mechanisms and scaling and growth/strike slips/reverses faults.



Further, the course will also discuss the fault linkage, displacement partitioning, hard/soft linkage, branch-line and branch-points and closure patterns; the structural interpretation of seismic data as well as interpretation of faults and horizons on 2D and 3D seismic; the pros and cons of autotracking; and the dip/azimuth analysis coherency techniques.

During this interactive course, participants will learn the fault seal techniques, juxtaposition analysis with Alland diagrams and control on fault seal mechanisms; the predictive algorithms, column height risking and fault transmissibilities in production; the fault populations, sampling of fault-population statistics and 1D and 2D prediction of sub-seismic faults; the fractured reservoir characterization, core and image logging and dynamic of fractured reservoirs; and the fault and fracture modelling (using geomechanical modelling, discrete fracture networki-DFN modelling etc.).

### **Course Objectives**

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

- Apply and gain an in-depth knowledge on structural geology and tectonics
- Discuss the basic revision of stress/strain and the mechanisms of fracture
- Identify faulting and folding, fault terminology and formation of extensional basins
- Recognize stretching models for rift basins and continental margins including isostasy and flexure and thermal effect lithospheric stretching
- Illustrate back stripping techniques, fault geometry and displacement patterns
- Describe fault shapes, fault-displacement contouring, fault growth mechanisms and scaling and growth/strike slips/reverses faults
- Describe fault linkage, displacement partitioning, hard/soft linkage, branch-line and branch-points and closure patterns
- Illustrate the structural interpretation of seismic data as well as interpretation of faults and horizons on 2D and 3D seismic
- Identify the pros and cons of autotracking and apply dip/azimuth analysis coherency techniques
- Employ fault seal techniques, juxtaposition analysis with Alland diagrams and control on fault seal mechanisms
- Describe predictive algorithms, column height risking and fault transmissibilities in production
- Review fault populations, sampling of fault-population statistics and 1D and 2D prediction of sub-seismic faults
- Discuss fractured reservoir characterization, core and image logging and dynamic of fractured reservoirs
- Illustrate fault and fracture modelling (using geomechanical modelling, discrete fracture networki-DFN modelling etc.)

### **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 structural geology and tectonics for those who are requiring training in modern methods of structural geology, economic geologists employed in exploration or mining, exploration/production geologists in oil/gas/drilling companies, mine geologists, geotechnical-mine engineers, hydrologists, engineering, and geologists dealing with rock stress-strain at operating or planned project sites.

### 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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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.
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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.

### 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 Geophysicist** with **over 30 years** of extensive experience within the **Oil, Gas and Petrochemical** Industries. His specialization widely covers in the areas of **Basic Geology, Correlation Methods, Coring & Core Analysis, Core Handling, Overburden Effects, Conventional Data, Archie Equations, Mercury Injection, Rock Mechanics, Petrophysical Techniques, Geological, Geophysical & Petrophysical Evaluations, Stratigraphy & Sedimentology, Subsurface Maps, Geological Cross-Sections, Drilling Fluids, Drilling Data Analysis, Mud Logging, Porosity, Permeability, Basin Analysis, Reservoir Characterization, Facies Analysis & Sequence Stratigraphy, Structural Geology, Wellsite, Slick Line Operation and Fracture Characterization**. Further, he is also well-versed in rock properties, seismic analysis, petroleum risk and decision, play analysis and risk assessment. Currently, he is the **Exploration Division General Manager and Board Member** of one of the leading Petrochemical Plant in the Middle East.

During his career life, Mr. Saber has gained his practical and field experience through his various significant position and dedication as the **Exploration Division General Manager, General Manager, Senior Geophysicist, Geophysicist, Expert Mud Logging Assistant and Geologist**. He is also a **Board Member of SUCO Strategy Plan Committee**, wherein he was responsible for supervision of **all Geological, Geophysical and Petro physical Operation activities** as well as **Data Processing** and supervising all activities pertaining to the software and hardware of work station.

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**), GSE and the Petroleum and Scientific Professional Syndicate. He has further delivered numerous trainings, courses, seminars and conferences internationally.

### 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® (Howard 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 | <b>PRE-TEST</b>  |
| 0830 – 0900 | <b>Introduction to Structural Geology</b>                          |
| 0900 – 0930 | <b>Basic Revision of Stress/Strain</b>                             |
| 0945 – 1000 | Break  |
| 1000 – 1030 | <b>Mechanism of Fracture</b>                                       |
| 1030 – 1100 | <b>Faulting &amp; Folding</b>                                      |
| 1100 – 1200 | <b>Fault Terminology</b>   |
| 1200 – 1215 | Break  |
| 1215 – 1315 | <b>Formation of Extensional Basins</b>                             |
| 1315 – 1420 | <b>Stretching Models for Rift Basins &amp; Continental Margins</b> |
| 1420 - 1430 | <b>Recap</b>   |
| 1430        | Lunch & End of Day One   |

**Day 2**

|             |   |
|-------------|---|
| 0730 – 0830 | <b>Isostasy</b>   |
| 0830 – 0930 | <b>Flexure &amp; Thermal Effect Lithospheric Stretching</b> |
| 0945 – 1000 | Break   |
| 1000 – 1030 | <b>Back Stripping Techniques (1D, 2D, 3D)</b>               |
| 1030 – 1100 | <b>Fault Geometry &amp; Displacement Patterns</b>           |
| 1100 – 1200 | <b>Fault Shapes (Planer/Listric)</b>                        |
| 1200 – 1215 | Break   |
| 1215 – 1315 | <b>Fault-Displacement Contouring</b>                        |
| 1315 – 1345 | <b>Fault Growth Mechanisms &amp; Scaling</b>                |
| 1345 - 1420 | <b>Growth/Strike Slips/Reverses Faults</b>                  |
| 1420 - 1430 | <b>Recap</b>  |
| 1430        | Lunch & End of Day Two                                      |

**Day 3**

|             |                                  |
|-------------|----------------------------------|
| 0730 – 0830 | <b>Fault Linkage</b>             |
| 0830 – 0930 | <b>Displacement Partitioning</b> |
| 0945 – 1000 | Break                            |
| 1000 – 1030 | <b>Hard/Soft Linkage</b>         |



|             |   |
|-------------|---|
| 1030 – 1100 | <b>Branch-line &amp; Branch-Points</b>                                |
| 1100 – 1200 | <b>Closure Patterns</b>   |
| 1200 – 1215 | <i>Break</i>  |
| 1215 – 1315 | <b>Structural Interpretation of Seismic Data</b>                      |
| 1315 – 1345 | <b>Interpretation of Faults &amp; Horizons on 2D &amp; 3D Seismic</b> |
| 1345 - 1420 | <b>Pros &amp; Cons of Autotracking</b>                                |
| 1420 - 1430 | <b>Recap</b>  |
| 1430        | <i>Lunch &amp; End of Day Three</i>                                   |

**Day 4**

|             |  |
|-------------|--|
| 0730 – 0830 | <b>Dip/Azimuth Analysis Coherency Techniques</b>   |
| 0830 – 0930 | <b>Fault Seal Techniques</b>                       |
| 0945 – 1000 | <i>Break</i>                                       |
| 1000 – 1030 | <b>Juxtaposition Analysis with Alland Diagrams</b> |
| 1030 – 1100 | <b>Control on Fault Seal Mechanisms</b>            |
| 1100 – 1200 | <b>Predictive Algorithms</b>                       |
| 1200 – 1215 | <i>Break</i>                                       |
| 1215 – 1315 | <b>Column Height Risking</b>                       |
| 1315 – 1345 | <b>Fault Transmissibilities in Production</b>      |
| 1345 - 1420 | <b>Fault Populations</b>                           |
| 1420 - 1430 | <b>Recap</b>                                       |
| 1430        | <i>Lunch &amp; End of Day Four</i>                 |

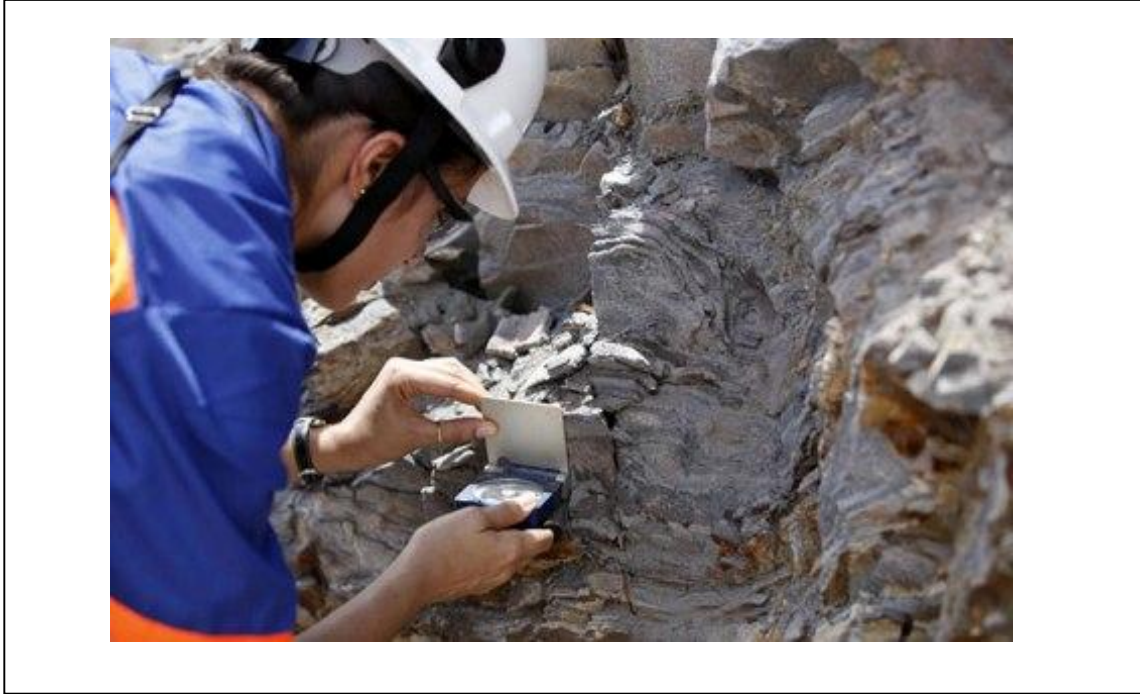
**Day 5**

|             |   |
|-------------|---|
| 0730 – 0830 | <b>Sampling of Fault-Population Statistics</b>  |
| 0830 – 0930 | <b>1D &amp; 2D Prediction of Sub-Seismic Faults</b>   |
| 0945 – 1000 | <i>Break</i>  |
| 1000 – 1030 | <b>Pelican Case Study</b>   |
| 1030 – 1100 | <b>Fractured Reservoir Characterization</b>   |
| 1100 – 1200 | <b>Core &amp; Image Logging</b>   |
| 1200 – 1215 | <i>Break</i>  |
| 1215 – 1315 | <b>Dynamic Understanding of Fractured Reservoirs</b>  |
| 1315 – 1345 | <b>Fault &amp; Fracture Modeling (Using Geomechanical Modeling, Discrete Fracture Networki-DFN Modeling Etc.)</b> |
| 1345 - 1400 | <b>Course Conclusion</b>  |
| 1400 - 1415 | <b>POST-TEST</b>  |
| 1415 - 1430 | <i>Presentation of Course Certificates</i>  |
| 1430        | <i>Lunch &amp; End of Course</i>  |



**Practical Sessions**

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



**Course Coordinator**

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