COURSE OVERVIEW DE0148
Formation Damage, Remediation & Well Stimulation

Course Title
Formation Damage, Remediation & Well Stimulation

Course Reference
DE0148

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

Course Date/Venue

Session(s)	Date	Venue
1	April 27-May 01, 2025	Slaysel 02 Meeting Room, Movenpick Hotel & Resort Al Bida'a Kuwait, City of Kuwait
2	July 27-31, 2025	Meeting Plus 9, City Centre Rotana Doha, Doha, Qatar
3	December 14-18, 2025	Meeting Plus 9, City Centre Rotana Doha, Doha, Qatar

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 participants with a detailed and up-to-date overview of formation damage, remediation and well stimulation. It covers the formation damage, field diagnosis and measurement of formation damage; the formation damage and pseudo-damage from well performance; the formation damage control and remediation as well as formation damage mitigation; the reservoir stimulation in petroleum production; and the formation characterization of well and reservoir testing.

During this interactive course, participants will learn the formation characterization of rock mechanics and well logs; the basics and mechanics of hydraulic fracturing; the fracturing fluid chemistry and proppants; the fracturing materials performance, fracture evaluation using pressure diagnostics and fracture treatment design; the fracturing operations, post-treatment evaluation and fractured well performance; the matrix treatments, fundamentals of acid stimulation and carbonate acidizing design; the matrix stimulation treatment evaluation; the causes and effects of sand production; and the sand control in open-hole completions, chemical consolidation methods and water control.

Course Objectives

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

- Apply and gain an in-depth knowledge on formation damage, remediation and well stimulation
- Discuss formation damage, field diagnosis and measurement of formation damage
- Determine, identify characterize and evaluate formation damage and pseudo-damage from well performance
- Describe formation damage control and remediation as well as formation damage mitigation
- Employ reservoir stimulation in petroleum production and recognize the formation characterization of well and reservoir testing
- Identify the formation characterization of rock mechanics and well logs
- Describe the basics and mechanics of hydraulic fracturing as well as the fracturing fluid chemistry and proppants
- Carryout fracturing materials performance, fracture evaluation using pressure diagnostics and fracture treatment design
- Employ fracturing operations, post-treatment evaluation and fractured well performance
- Discuss matrix treatments, fundamentals of acid stimulation and carbonate acidizing design
- Apply matrix stimulation treatment evaluation and recognize the causes and effects of sand production
- Employ sand control in open-hole completions, chemical consolidation methods and water control

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 formation damage, remediation and well stimulation for petroleum engineers and petroleum industry professionals who are involved in the important activities of reservoir evaluation, development and management and for those who require invaluable skills in the application of the techniques described for the successful exploitation of oil and gas reservoirs.

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. Mamdouh El-Sherif is a **Senior Petroleum & Drilling Engineer** with over **30 years** of **offshore & onshore Petroleum** practical experience. His expertise lies extensively in the areas of **Formation Damage, Remediation & Well Stimulation**, **Well Completion & Workover**, **Applied Production Logging & Reservoir Monitoring**, **Cased Hole Logging**, **Cased-hole Application**, **Hydraulic Fracturing** Applications, **Artificial Lift Methods**, **Artificial Lift** Systems, **Pressure Transient Analysis**, **Enhanced Oil Recovery**, **Coil Tubing**, **Slickline & Wireline**, **Perforating Methods** & Basic **Perforating Design**, **Fishing Operations**, **Stuck Pipe**, Applied **Reservoir Stimulation**, Applied **Drilling** Practices, Horizontal **Drilling**, Petroleum Production, **Well & Reservoir Testing**, **Carbonate Acidizing**, **Well Completion** Design & Operation, **Well Integrity** Management, **Well Stimulation**, **Well Testing**, Electric Submersible Pump Systems (**ESP**), **Artificial Lift & Nodal Analysis**, Formation Evaluation, Sucker Rod Pump Systems, **Subsurface Production** Operations & Technology, Water Control, **Workover & Completion Operations**, **Reservoir Performance**, Rod-Pump Design, Gas Lift Design, ESP Components, ESP System Analysis, ESP Control, **Reservoir Monitoring** and **Production** (**Case Hole**) **Logging**. He is currently the **Operations General Manager** of **JV Petroleum Company** wherein he is in-charge in managing asset integrity, well integrity process, pre-commissioning/commissioning and start up onshore & offshore process facilities.

Earlier in his career, Mr. Mamdouh was the **Chairman** for the selection of **Artificial Lift Systems** and **Well Completion Designs** and he took charge in the **Production System Optimization**, **Surface Facility Optimization** for **Wells**, **Flowline Size Selection**, **Procedure Design**, **Start-up & Commissioning** of **Central Production Facilities** and the **Wireline and Completion Evaluation & Analysis**. Prior to this, he worked as a **Senior Production Operations Engineer** where he was responsible for the **evaluation** of field development plans and performed evaluation of drill steam test results (**DST**'s), surface facilities & subsurface completion selection, hydraulic pump (jet pump) selection, pipeline size optimization for handling paraffinic crude and site selection for production plan installation. He has been the Coordinator Petroleum Engineer, **Senior Petroleum Engineer**, **Production Operation Engineer** (Petroleum Engineering) and **Production Technology/Operation Engineer** of **Gupco**, **Eshpetco Oil Company** and **Turkish Petroleum Company**.

Mr. Mamdouh has a **Bachelor** degree in **Petroleum Engineering** and a **Diploma** in **Production Petroleum Engineering** from the **Cairo University**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Trainer/Assessor** by the **Institute of Leadership & Management** (**ILM**) and a **co-author** for the **2008 SPE Indian Oil & Gas Technical Conference & Exhibition.** Moreover, he is a member of **Society of Petroleum Engineer** (**SPE**) and has presented **numerous papers** in the **Production & Exploration Conference**, the **BP Subsurface Forum** and the **Improved Oil Recovery Middle East Conference**. He has further delivered numerous trainings, workshops 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

Kuwait	**US$ 5,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Doha	**US$ 6,000** per Delegate. 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	***Overview of Formation Damage*** *Common Formation Damage Problems, Factors & Mechanisms • Understanding & Mitigation of Formation Damage • Origin of Petroleum-Bearing Formations • Constituents of Sedimentary Rocks • Composition of Petroleum-Bearing Formations • Mineral Sensitivity of Sedimentary Formations • Mechanisms of Clay Swelling • Models for Clay Swelling • Cation Exchange Capacity • Shale Swelling & Stability*
0930 – 0945	*Break*
0945 – 1100	***Field Diagnosis & Measurement of Formation Damage*** *Diagnosis and Evaluation of Formation Damage in the Field • Pseudo-Damage vs. Formation Damage • Measures of Formation Damage • Model-Assisted Estimation of Skin Factor • Model-Assisted Analysis of the Near-Wellbore Permeability Alteration Using Pressure Transient Data • Productivity Decline Caused by Mud Invasion into Naturally Fractured Reservoirs • Continuous Real Time Series Analysis for Detection and Monitoring Formation Damage Effects • Formation Damage Expert System*

1100 – 1230	***Determination of Formation Damage & Pseudo-Damage from Well Performance-Identification, Characterization & Evaluation*** *Completion damage and Flow Efficiency ● Formation Damage and Flow Efficiency ● Formation Damage Assessment in the Field by Well Surveillance ● Well-Testing Techniques, Reservoir Parameters, and Interpretation Methods ● Components of the Total Skin Factor ● Variable Skin Factor*
1230 – 1245	*Break*
1245 – 1330	***Formation Damage Control & Remediation*** *Selection of Treatment Fluids ● Clay Stabilization ● Clay and Slit Fines ● Effect of Drilling Fluids on Shale Stability ● Bacterial Damage ● Inorganic Scales ● Organic Deposits ● Mixed Organic/Inorganic Deposits ● Formation damage Induced by Completion-Fluids and Crude-Oil Emulsions ● Wettability Alteration and Emulsion and Water Blocks ● Intense Heat Treatment ● Sand Control ● Well Stimulation ● Recaputalization of the Methods For Formation Damage Mitigation ● Sandstone and Carbonate Formation Acidizing ● Water Injectivity of Management ● Controlling the Adverse Side effects of Remedial Treatments*
1330 – 1420	***Formation Damage Mitigation*** *Comprehensive Methodology for Mitigation of Formation Damage ● Treatment Fluid Application Methods ● Thermal and Hydraulic Coupling of Wellbore with Reservoir During Remedial Fluid Treatments Illustrated for Hydraulically Fractured Well Acidizing*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Reservoir Stimulation in Petroleum Production*** *Introduction ● Inflow Performance ● Alterations in the Near-Wellbore Zone ● Tubing Performance & NODAL* Analysis ● Decision Process for Well Stimulation ● Reservoir Engineering Considerations for Optimal Production Enhancement Strategies ● Stimulation Execution*
0830 – 0930	***Formation Characterization: Well & Reservoir Testing*** *Evolution of a Technology ● Pressure Derivative in Well Test Diagnosis ● Parameter Estimation from Pressure Transient Data ● Test Interpretation Methodology ● Analysis with Measurement of Layer Rate ● Layered Reservoir Testing ● Testing Multilateral & Multibranch Wells ● Permeability Determination from a Fracture Injection Test*
0930 – 0945	*Break*
0945 – 1100	***Formation Characterization: Rock Mechanics*** *Basic Concepts ● Rock Behavior ● Rock Mechanical Property Measurement ● State of Stress in the Earth ● In-situ Stress Management*
1100 – 1230	***Formation Characterization: Well Logs*** *Depth ● Temperature ● Properties Related to the Diffusion of Fluids ● Properties Related to the Deformation & Fracturing of Rock ● Zoning*

1230 – 1245	*Break*
1245 – 1420	***Basics of Hydraulic Fracturing*** *Overview of Hydraulic Fracturing ● In-Situ Stress ● Reservoir Engineering ● Rock & Fluid Mechanics ● Treatment Pump Scheduling ● Economics & Operational Considerations*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Mechanics of Hydraulic Fracturing*** *History of Early Hydraulic Fracture Modeling ● Three-Dimensional & Pseudo-Three-Dimensional Models ● Leakoff ● Proppant Placement ● Heat Transfer Models ● Fracture Tip Effects ● Tortuosity & Other Near-Well Effects ● Acid Fracturing ● Multilayer Fracturing ● Pump Schedule Generation ● Pressure History Matching*
0830 – 0930	***Fracturing Fluid Chemistry & Proppants*** *Water-Base Fluids ● Oil-Base Fluids ● Acid-Based Fluids ● Multiphase Fluids ● Additives ● Proppants ● Execution*
0930 – 0945	*Break*
0945 – 1100	***Performance of Fracturing Materials*** *Fracturing Fluid Characterization ● Characterization Basics ● Translation of Field Conditions to a Laboratory Environment ● Molecular Characterization of Gelling Agents ● Rheology ● Proppant Effects ● Fluids Loss*
1100 – 1230	***Fracture Evaluation Using Pressure Diagnostics*** *Fundamental Principles of Hydraulic Fracturing ● Pressure During Pumping ● Analysis During Fracture Closure ● Pressure Interpretation After Fracture Closure ● Numerical Simulation of Pressure: Combined Analysis of Pumping & Closing ● Comprehensive Calibration Test Sequence*
1230 – 1245	*Break*
1245 – 1420	***Fracture Treatment Design*** *Design Considerations ● Geometry Modeling ● Treatment Schedule ● Multilayer Fracturing ● Acid Fracturing ● Deviated Wellbore Fracturing*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Fracturing Operations*** *Completions ● Perforating ● Surface Equipment for Fracturing Operations ● Bottomhole Pressure Measurement & Analysis ● Proppant Flowback Control ● Flowback Strategies ● Quality Assurance & Quality Control ● Health, Safety & Environment*
0830 – 0930	***Post-Treatment Evaluation & Fractured Well Performance*** *Post-Treatment Fracture Evaluation ● Factors Affecting Fractured Well Performance ● Well Test Analysis of Vertically Fractured Wells ● Prediction of Fractured Well Performance*
0930 – 0945	*Break*

0945 – 1100	***Introduction to Matrix Treatments*** *Candidate Selection ● Formation Damage Characterization ● Stimulation Technique Determination ● Treatment Design ● Final Economic Evaluation ● Execution ● Treatment Evaluation*
1100 – 1230	***Fundamentals of Acid Stimulation*** *Acid-Mineral Interactions ● Sandstone Acidizing ● Carbonate Acidizing*
1230 – 1245	*Break*
1245 – 1420	***Carbonate Acidizing Design*** *Rock & Damage Characteristics in Carbonate Formations ● Carbonate Acidizing with Hydrochloric Acid ● Other Formulations ● Treatment Design*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0830	***Matrix Stimulation Treatment Evaluation*** *Derivation of Bottomhole Parameters from Wellhead Measurements ● Monitoring Skin Effect Evolution During Treatment ● Prouvost and Economides Method ● Behenna Method ● Inverse Injectivity Diagnostic Plot ● Limitations of Matrix Treatment Evaluation Techniques ● Treatment Response Diagnosis ● Post-Treatment Evaluation*
0830 – 0930	***Causes & Effect of Sand Production*** *The Geology of Sedimentary Formations ● The Nature of Cohesive Failure and Contributing Issues ● Terms that Describe Sanding Formations*
0930 – 0945	*Break*
0945 – 1100	***Sand Control in Open-Hole Completions*** *Fluids Related to Drill-In (Fluid Loss Control) ● Sand Exclusion Devices ● Vertical Open-Hole Completions*
1100 – 1230	***Chemical Consolidation Methods*** *Consolidation Resins Used in Pre-Pack Screens ● Epoxy Resin Consolidation Systems ● Furan Resin Consolidation Systems*
1230 – 1245	*Break*
1245 – 1345	***Water Control*** *Characteristics of Produced Water ● Scale Removal ● Controlling Scale Using Chemical Inhibitors ● Sand & Other Suspended Solids ● System Description ● Equipment Description & Sizing Skim Tanks & Skim Vessels ● Oil/Water/Sediment Coalescing Separators*
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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