

COURSE OVERVIEW DE0271
Petrel Uncertainty and Optimization

Course Title

Petrel Uncertainty and Optimization

Course Reference

DE0271

Course Duration/Credits

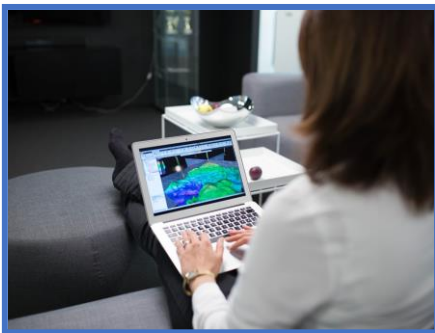
Five days/3.0 CEUs/30 PDHs



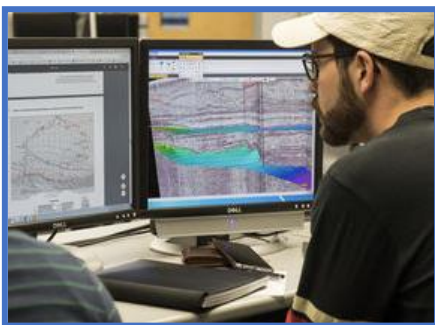
Course Date/Venue

Session(s)	Date	Venue
1	April 28-May 02, 2024	Oryx Meeting Room, DoubleTree By Hilton Doha-Al Sadd, Doha, Qatar
2	September 01-05, 2024	
3	December 08-12, 2024	

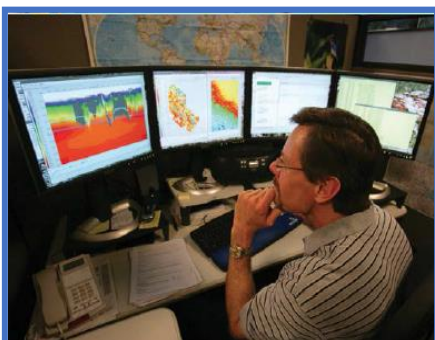
Course Description



This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.



This course is designed to provide participants with a detailed and up-to-date overview of Petrel Uncertainty and Optimization. It covers the capabilities and applications of Petrel software for uncertainty management; the concepts of uncertainty in reservoir modeling; data importing at management for uncertainty analysis; the fundamental concepts and tools of geostatistics and probabilistic modeling; the basic uncertainty study in Petrel and effective ways to visualize uncertain data; the advanced geostatistical methods in Petrel, parametrization of uncertainty monte carlo simulations and handling spatial uncertainty; the uncertainty in porosity, permeability and saturation; and the perform dynamic data integration for uncertainty analysis.



During this interactive course, participants will learn the systematic techniques and best practices in calibrating static models with dynamic data; the sensitivity analysis and scenario evaluation, workflow optimization for history matching and reservoir optimization; the geomodels to reservoir simulation for optimization; the optimization algorithms in Petrel; the field development planning under uncertainty, economic aspects and optimization and advanced uncertainty analysis methods; the workflows for uncertainty and optimization; the risk management and decision making under uncertainty; the emerging technologies and future developments in Petrel; and the implement best practices for reporting and presentation of results.

Course Objectives

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

- Apply and gain an in-depth knowledge on Petrel Uncertainty and Optimization
- Explain the capabilities and applications of Petrel software for uncertainty management
- Discuss the concepts of uncertainty in reservoir modeling and apply data import at management for uncertainty analysis
- Explain the fundamental concepts and tools of geostatistics and probabilistic modeling
- Setup basic uncertainty study in Petrel and apply effective ways to visualize uncertain data
- Carryout advanced geostatistical methods in Petrel, parametrization of uncertainty, monte carlo simulations and handling spatial uncertainty
- Manage uncertainty in porosity, permeability and saturation as well as perform dynamic data integration for uncertainty analysis
- Utilize Petrel for efficient history matching and apply systematic techniques and best practices in calibrating static models with dynamic data
- Employ sensitivity analysis and scenario evaluation, workflow optimization for history matching and reservoir optimization
- Link geomodels for reservoir simulation for optimization and illustrate optimization algorithms in Petrel
- Apply field development planning under uncertainty, economic aspects and optimization and advanced uncertainty analysis methods
- Customize workflows for uncertainty and optimization and apply risk management and decision making under uncertainty
- Discuss the emerging technologies and future developments in Petrel and implement best practices for reporting and presentation of results

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 petrel uncertainty and optimization for geologists, geophysicists, petrophysicists, reservoir engineers, production engineers, drilling engineers and technical support staff who work with geoscientists and engineers.

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.

Course Fees

US\$ 8,500 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 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. Konstantin Zorbalas, MSc, BSc, is a Senior Petroleum Engineer & Well Completions Specialist with over 25 years of offshore and onshore experience in the Oil & Gas, Refinery & Petrochemical industries. His wide expertise includes Workovers & Completions, Petroleum Risk & Decision Analysis, Acidizing Application in Sandstone & Carbonate, Well Testing Analysis, Stimulation Operations, Reserves Evaluation, Reservoir Fluid Properties, Reservoir Engineering & Simulation Studies, Reservoir Monitoring, Artificial Lift Design, Gas Operations, Workover/Remedial Operations & Heavy Oil Technology, Applied Water Technology, Oil & Gas Production, X-mas Tree & Wellhead Operations & Testing, Artificial Lift Systems (Gas Lift, ESP, and Rod Pumping), Well Cementing, Production Optimization, Well Completion Design, Sand Control, PLT Correlation, Slickline Operations, Acid Stimulation, Well testing, Production Logging, Project Evaluation & Economic Analysis. Further, he is actively involved in **Project Management** with special emphasis in production technology and field optimization, performing conceptual studies, economic analysis with risk assessment and field development planning. He is currently the **Senior Petroleum Engineer & Consultant of National Oil Company** wherein he is involved in the mega-mature fields in the Arabian Gulf, predominantly carbonate reservoirs; designing the acid stimulation treatments with post-drilling rigless operations; utilizing CT with tractors and DTS systems; and he is responsible for gas production and preparing for reservoir engineering and simulation studies, well testing activities, field and reservoir monitoring, production logging and optimization and well completion design.

During his career life, Mr. Zorbalas worked as a **Senior Production Engineer, Well Completion Specialist, Production Manager, Project Manager, Technical Manager, Technical Supervisor & Contracts Manager, Production Engineer, Production Supervisor, Production Technologist, Technical Specialist, Business Development Analyst, Field Production Engineer and Field Engineer.** He worked for many world-class oil/gas companies such as **ZADCO, ADMA-OPCO, Oilfield International Ltd, Burlington Resources** (later acquired by **Conoco Phillips**), **MOBIL E&P, Saudi Aramco, Pluspetrol E&P SA, Wintershall, Taylor Energy, Schlumberger, Rowan Drilling and Yukos EP** where he was in-charge of the **design and technical analysis** of a gas plant with capacity **1.8 billion m3/yr gas.** His achievements include **boosting oil production 17.2% per year** since 1999 using **ESP and Gas Lift systems.**

Mr. Zorbalas has **Master and Bachelor** degrees in **Petroleum Engineering** from the **Mississippi State University, USA.** Further, he is an **SPE Certified Petroleum Engineer, Certified Instructor/Trainer, a Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM),** an active member of the Society of Petroleum Engineers (**SPE**) and has numerous scientific and technical publications and delivered innumerable training courses, seminars and workshops 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 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 - 0900	Overview of Petrel Software for Uncertainty Management: Capabilities & Applications
0900 - 0930	Concepts of Uncertainty in Reservoir Modeling: Different Types of Uncertainty
0930 - 0945	Break
0945 - 1130	Data Import & Management for Uncertainty Analysis: Best Practices in Managing Data
1130 - 1230	Geostatistics & Probabilistic Modeling: Fundamental Concepts & Tools
1230 - 1245	Break
1245 - 1300	Setting Up a Basic Uncertainty Study in Petrel: Step-By-Step Guide to Initiating an Uncertainty Analysis
1300 - 1420	Visualization Techniques for Uncertainty: Effective Ways to Visualize Uncertain Data
1420 - 1430	Recap
1430	Lunch & End of Day One

Day 2

0730 - 0830	Advanced Geostatistical Methods in Petrel: Kriging, Co-Kriging & Stochastic Modeling
0830 - 0930	Parameterization of Uncertainty: Defining & Managing Input Parameters
0930 - 0945	Break
0945 - 1130	Monte Carlo Simulations in Petrel: Setting Up & Running Monte Carlo Simulations
1300 - 1230	Handling Spatial Uncertainty: Techniques for Modeling Spatial Variability
1230 - 1245	Break
1245 - 1300	Uncertainty In Petrophysical Properties: Managing Uncertainty in Porosity, Permeability & Saturation
1300 - 1420	Practical Exercise: Creating a Geostatistical Model with Uncertainty Parameters
1420 - 1430	Recap
1430	Lunch & End of Day Two

Day 3

0730 – 0830	Dynamic Data Integration for Uncertainty Analysis: Incorporating Production & Well Test Data
0830 - 0930	Automated History Matching Tools in Petrel: Utilizing Petrel for Efficient History Matching
0930 – 0945	Break
0945 – 1130	Calibrating Static Models with Dynamic Data: Techniques & Best Practices
11:30 – 1230	Sensitivity Analysis & Scenario Evaluation: The Impact of Different Parameters
1230 – 1245	Break
1245 - 1300	Workflow Optimization for History Matching: Streamlining the History Matching Process
1300 - 1420	Group Activity: Performing History Matching on a Model with Uncertain Parameters
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4

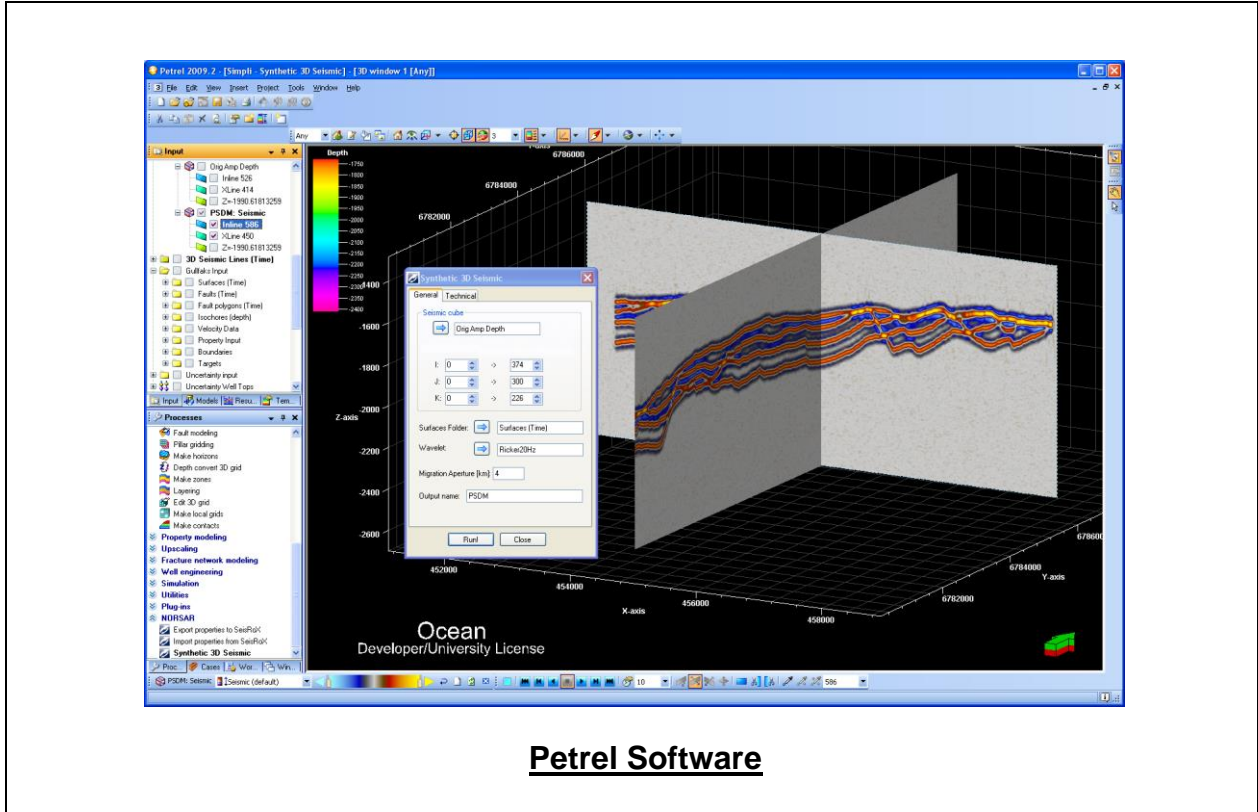
0730 – 0830	Overview of Reservoir Optimization: Goals & Methodologies
0830 - 0930	Linking Geomodels to Reservoir Simulation for Optimization: Techniques for Integration
0930 – 0945	Break
0945 – 1130	Optimization Algorithms in Petrel: Exploring Available Tools & Methods
1300 – 1230	Field Development Planning Under Uncertainty: Strategies for Optimizing Well Placement & Production
1230 – 1245	Break
1245 - 1300	Economic Aspects of Optimization: Considering Cost Factors in Decision-Making
1300 - 1420	Case Study Review: Analysis of an Optimization Project Using Petrel
1420 – 1430	Recap
1430	Lunch & End of Day Four

Day 5

0730 – 0830	Advanced Uncertainty Analysis Methods: Exploring Cutting-Edge Techniques
0830 - 0930	Customizing Workflows for Uncertainty & Optimization: Tailoring Petrel Workflows to Specific Needs
0930 – 0945	Break
0945 – 1130	Risk Management & Decision Making Under Uncertainty: Approaches for Handling Risk
1130 – 1230	Emerging Technologies & Future Developments in Petrel: Keeping Up-to-Date with Software Advancements
1230 – 1245	Break
1245 – 1345	Best Practices for Reporting & Presentation of Results: Effective Communication of Uncertainty & Optimization Studies
1345 – 1400	Course Conclusion
1400 – 1415	POST-TEST
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course

Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the “Petrel” software.



Petrel Software

Course Coordinator

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