

COURSE OVERVIEW DE0271
Petrel Uncertainty for Reservoir Engineers

Course Title

Petrel Uncertainty for Reservoir Engineers

Course Date/Venue

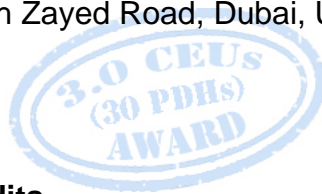
December 15-19, 2024/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference

DE0271

Course Duration/Credits

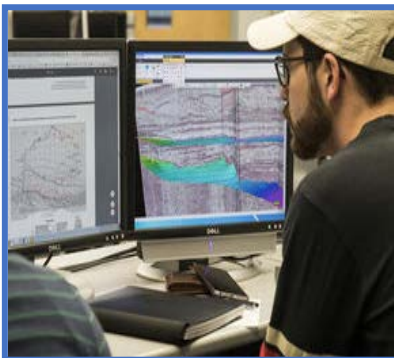
Five days/3.0 CEUs/30 PDHs



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, sample video clips of the instructor’s actual lectures & practical sessions during the course 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 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.

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.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Instructor

This course will be conducted by the following instructor. However, we have the right to change the course instructor prior to the course date and inform participants accordingly:



Dr. John Petrus, PhD, MSc, BSc, is a **Senior Reservoir Engineer & Geologist** with over **30 years of onshore & offshore** experience within the **Oil & Gas, Refinery and Petroleum** industries. His wide experience covers in the areas of **Petrel Geology, Decision Analysis & Uncertainty Management, Geostatistical Methods, Dynamic Data Integrating, Production Technology & Engineering, Well Stimulation & Control and Workover Planning, Completions & Workover**, Hole Cleaning & Logging, Servicing and **Work-Over Operations, Wellhead Operations, Maintenance & Testing, Petrophysics/Interpretation of Well Composite, Reservoir & Tubing Performance, Practical Reservoir Engineering, Clastic Exploration & Reservoir Sedimentology, Carbonate Reservoir Characterization & Modeling, Seismic Interpretation, Mapping & Reservoir Modelling, Reservoir Geology**, Integrating **Geoscience into Carbonate Reservoir Management, Faulted & Fractured Reservoirs, Fractured Hydrocarbon Reservoirs**, Analyses, Characterization & Modelling of **Fractured Reservoirs & Prospects, Fracture Reservoir Modeling Using Petrel, Reservoir Engineering Applied Research, Artificial Lift, Artificial Lift System Selection & Design, Electrical Submersible Pumps (ESP), Enhance Oil Recovery (EOR), Hydraulic Fracturing, Sand Control Techniques, Perforating Methods & Design, Perforating Operations, Petroleum Exploration & Production, Hydrocarbon Exploration & Production, Exploration & Production, Play Assessment & Prospect Evaluation, Formation Evaluation, Petroleum Engineering Practices, Petroleum Hydrogeology & Hydrodynamics, Project Uncertainty, Decision Analysis & Risk Management, Exploration & Development Geology, Sedimentology & Sequence Stratigraphy, Structural Interpretation in Exploration & Development, Geomodelling, Structural Geology, Applied Structural Geology in Hydrocarbon Exploration, Petrophysics, Geology of the Oil & Gas Field, Geophysics, Geothermal, Geochemical & Geo-Engineering** and Drilling Applied Research, Field Geological Outcrop Mapping & Digital Cartography, **Geological Modelling, Geoscience Management in E&P, Geoscience Modelling, Geological Mapping, Structural Geology-Tectonics, Structural Analysis, Tectonic Modelling and Numerical Simulation of Fractured Prospects & Reservoirs, Fracture Network Analysis & Modelling, Prospect Generation, Global Networking, Research and Technology Development Management for Fault & Fracture Analyses & Modelling, Fracture Modelling, Dynamic Modelling, Field Development Planning, Water Injection Planning, Stereophotogrammetry, Fault Mapping, GPS Survey, 2D & 3D Seismic Acquisition & Processing, 3D Seismic Surveys & Mapping, 3D GIS, GMAP, Sandbox Modelling, Sedimentological Logging, GR Logging, Surface & Subsurface 3D Modelling, Best Practices Management System (BPMS), Subsurface Work for Energy Projects, Digitalization Projects, Structural Model using Petrel, G&G Seismic & Well Data Modelling, GIS System Management, Database Management, Strategic Planning, Best Practices and Workflow, Quality Management, Project Management and Risk Assessment & Uncertainty Evaluation. Further, he is also well-versed in **seismic interpretation, mapping & reservoir modelling tools like Petrel software, LandMark, Seisworks, Geoframe, Zmap** and has extensive knowledge in **MSDos, Unix, AutoCAD, MAP, Overlay, Quicksurf, 3DStudio, Esri ArcGIS, Visual Lisp, Fortran-77 and Clipper**. Moreover, he is a world **expert in analysis and modelling of fractured prospects and reservoirs** and a **specialist and developer of fracture modelling software tools** such as **FPDM, FMX and DMX Protocols**.**

During his career life, Dr. Petrus held significant positions and dedication as the **Executive Director, Senior Geoscience Advisor, Exploration Manager, Project Manager, Manager, Chief Geologist, Chief of Exploration, Chief of Geoscience, Senior Geosciences Engineer, Senior Explorationist, Senior Geologist, Geologist, Senior Geoscientist, Geomodeller, Geoscientist, CPR Editor, Resources Auditor, Project Leader, Technical Leader, Team Leader, Scientific Researcher and Senior Instructor/Trainer** from various international companies and universities such as the **Dragon Oil Holding Plc., ENOC, MENA, ENI Group of Companies, Ocre Geoscience Services (OGS), Burren RPL, Ministry of Oil-Iraq, Eni Corporate University, Stanford University, European Universities, European Research Institutes, NorskHydro Oil Company, Oil E&P Companies**, just to name a few.

Dr. Petrus has a **PhD in Geology and Tectonophysics** and **Master's and Bachelor's degree in Earth Sciences** from the **Utrecht University, The Netherlands**. Further, he is a **Certified Instructor/Trainer, a Certified Trainer/Assessor/Internal Verifier** by the **Institute of Leadership & Management (ILM)**, a Secretary and Treasurer of Board of Directors of Multicultural Centre, Association Steunfonds SSH/SSR and Founding Member of Sfera Association. He has further published several scientific publications, journals, research papers and books and delivered numerous trainings, workshops, 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 Program

The following program is planned for this course. However, the course instructor 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: Sunday, 15th of December 2024

0730 - 0800	<i>Registration & Coffee</i>
0800 - 0815	<i>Welcome & Introduction</i>
0815 - 0830	PRE-TEST
0830 - 0900	<i>Overview of Petrel Software for Uncertainty Management: Capabilities & Applications</i>
0900 - 0930	<i>Concepts of Uncertainty in Reservoir Modeling: Different Types of Uncertainty</i>
0930 - 0945	<i>Break</i>
0945 - 1130	<i>Data Import & Management for Uncertainty Analysis: Best Practices in Managing Data</i>
1130 - 1230	<i>Geostatistics & Probabilistic Modeling: Fundamental Concepts & Tools</i>
1230 - 1245	<i>Break</i>
1245 - 1300	<i>Setting Up a Basic Uncertainty Study in Petrel: Step-By-Step Guide to Initiating an Uncertainty Analysis</i>
1300 - 1420	<i>Visualization Techniques for Uncertainty: Effective Ways to Visualize Uncertain Data</i>
1420 - 1430	Recap
1430	<i>Lunch & End of Day One</i>

Day 2: Monday, 16th of December 2024

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

Day 3: Tuesday, 17th of December 2024

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

Day 4: Wednesday, 18th of December 2024

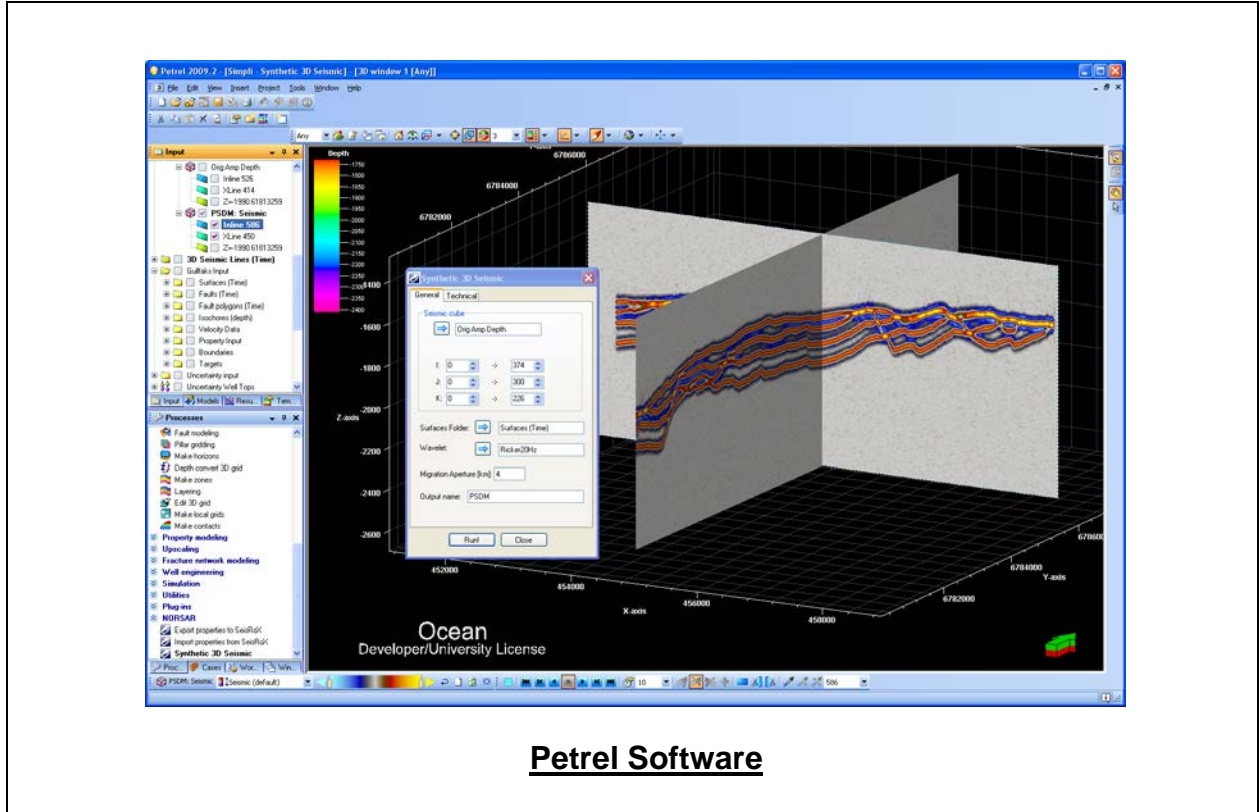
0730 – 0830	<i>Overview of Reservoir Optimization: Goals & Methodologies</i>
0830 - 0930	<i>Linking Geomodels to Reservoir Simulation for Optimization: Techniques for Integration</i>
0930 – 0945	Break
0945 – 1130	<i>Optimization Algorithms in Petrel: Exploring Available Tools & Methods</i>
1300 – 1230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

Day 5: Thursday, 19th of December 2024

0730 – 0830	<i>Advanced Uncertainty Analysis Methods: Exploring Cutting-Edge Techniques</i>
0830 - 0930	<i>Customizing Workflows for Uncertainty & Optimization: Tailoring Petrel Workflows to Specific Needs</i>
0930 – 0945	Break
0945 – 1130	<i>Risk Management & Decision Making Under Uncertainty: Approaches for Handling Risk</i>
1130 – 1230	<i>Emerging Technologies & Future Developments in Petrel: Keeping Up-to-Date with Software Advancements</i>
1230 – 1245	Break
1245 – 1345	<i>Best Practices for Reporting & Presentation of Results: Effective Communication of Uncertainty & Optimization Studies</i>
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.



Course Coordinator

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