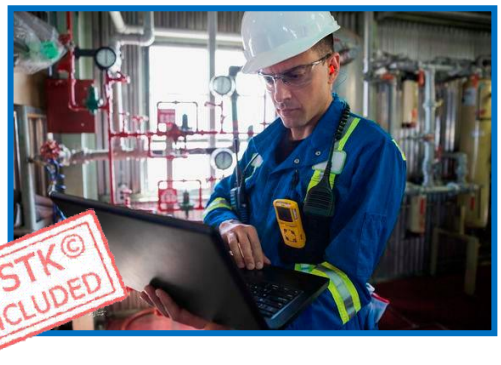
COURSE OVERVIEW DE0235
Reservoir Modeling

Course Title
Reservoir Modeling

Course Reference
DE0235

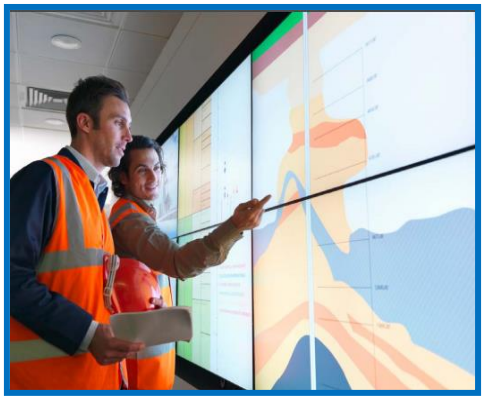
Course Duration/Credits
Five days/3.0 CEUs/30 PDHs



Course Date/Venue

Session(s)	Date	Venue
1	February 18-22, 2024	Oryx Meeting Room, DoubleTree By Hilton Doha-Al Sadd, Doha, Qatar
2	April 21-25, 2024	
3	May 19-23, 2024	
4	October 20-24, 2024	

Course Description



This practical and highly-interactive course includes real-life case studies 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 Reservoir Modeling. It covers the importance, objectives and impact of reservoir modeling on field development; the fundamentals of reservoir geology, reservoir properties, rock physics and data acquisition for reservoir modeling; the basic concepts in geostatistics and the commonly used modeling software; the structural modeling techniques, stratigraphic modeling and layering and petroleum system modeling; the volume calculations and uncertainty in structural and stratigraphic models; and the systematic methods for distributing petrophysical properties within the reservoir model.

During this interactive course, participants will learn the fluid property modeling and techniques for upscaling data to simulation scales; the models for reservoir simulation and seting-up initial conditions and boundary constraints for simulation; the fundamentals of reservoir simulation, numerical methods in reservoir simulation including history matching and model calibration; the reservoir simulation with field data; the machine learning and AI in reservoir modeling, challenges in unconventional reservoirs and streamlining reservoir modeling process; and the production forecasting, scenario analysis, reservoir management and optimization and advanced simulation techniques.

Course Objectives

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

- Apply and gain an in-depth knowledge on reservoir modeling
- Explain the importance, objectives and impact of reservoir modeling on field development
- Discuss the fundamentals of reservoir geology, reservoir properties, rock physics and data acquisition for reservoir modeling
- Explain the basic concepts in geostatistics and identify the commonly used modeling software
- Illustrate structural modeling techniques, stratigraphic modeling and layering and petroleum system modeling
- Apply volume calculations and discuss the uncertainty in structural and stratigraphic models
- Carryout systematic methods for distributing petrophysical properties within the reservoir model
- Illustrate fluid property modeling and techniques for upscaling data to simulation scales
- Prepare models for reservoir simulation and set-up initial conditions and boundary constraints for simulation
- Discuss the fundamentals of reservoir simulation, numerical methods in reservoir simulation including history matching and model calibration
- Integrate reservoir simulation with field data and discuss machine learning and AI in reservoir modeling, challenges in unconventional reservoirs and streamlining reservoir modeling process
- Apply production forecasting, scenario analysis, reservoir management and optimization and advanced simulation techniques

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 reservoir modeling for petroleum engineers, geoscientists, reservoir engineers, asset managers, oil and gas executives and other technical staff.

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 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:-

- 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.

- 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 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:

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 **Production Technology** & Engineering, **Well Completions**, **Well Logs**, **Well Stimulation** & **Production Logging**, **Well Completion** Design & Operation, Well Surveillance, **Well Testing**, **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, Characterisation & 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, **Decision Analysis & Uncertainty** Management, **Exploration & Development Geology**, **Sedimentology & Sequence Stratigraphy**, **Structural Interpretation** in Exploration & Development, **Petrel Geology**, **Geomodeling**, **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, Standford 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(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 Reservoir Modeling**: Importance, Objectives & Impact on Field Development*
0900 - 0930	***Fundamentals of Reservoir Geology**: Depositional Environments, Stratigraphy & Rock Types*
0930 – 0945	*Break*
0945 – 1130	***Reservoir Properties & Rock Physics**: Key Reservoir Properties like Porosity, Permeability & Saturation*
1130 – 1230	***Data Acquisition for Reservoir Modeling**: Sources of Data Including Well Logs, Core Data & Seismic Data*
1230 – 1245	*Break*
1245 - 1300	***Basic Concepts in Geostatistics**: Geostatistical Methods in Reservoir Characterization*
1300 - 1420	***Software Tools in Reservoir Modeling**: Commonly Used Modeling Software*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Structural Modeling Techniques**: Creating Structural Frameworks, Fault Modeling & Grid Generation*
0830 - 0930	***Stratigraphic Modeling & Layering**: Methods for Modeling Stratigraphic Sequences & Layer Properties*
0930 – 0945	*Break*
0945 – 1130	***Petroleum System Modeling**: Integrating Source Rock, Migration & Trap Analysis*
1300 – 1230	***Volume Calculations**: Estimating In-Place Volumes Using Geological Models*
1230 – 1245	*Break*
1245 - 1300	***Uncertainty in Structural & Stratigraphic Models**: Identifying & Managing Uncertainties*
1300 - 1420	***Case Studies**: Examples of Structural & Stratigraphic Modeling in Different Reservoirs*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Petrophysical Property Distribution***: *Methods for Distributing Petrophysical Properties within the Reservoir Model*
0830 - 0930	***Fluid Property Modeling***: *Modeling Fluid Characteristics in the Reservoir*
0930 – 0945	*Break*
0945 – 1130	***Scale-Up & Grid Optimization***: *Techniques for Upscaling Data to Simulation Scales.*
1300 – 1230	***Preparing Models for Reservoir Simulation***: *Workflow from Geological Model to Simulation Model*
1230 – 1245	*Break*
1245 - 1420	***Initial & Boundary Conditions***: *Setting Up Initial Conditions & Boundary Constraints for Simulation*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Fundamentals of Reservoir Simulation***: *The Basics of Fluid Flow Simulation in Reservoirs*
0830 - 0930	***Numerical Methods in Reservoir Simulation***: *Numerical Techniques Used in Simulation*
0930 – 0945	*Break*
0945 – 1130	***History Matching & Model Calibration***: *Techniques for Adjusting Models to Match Historical Production Data*
1300 – 1230	***Production Forecasting & Scenario Analysis***: *Predicting Future Production & Analyzing Different Development Scenarios*
1230 – 1245	*Break*
1245 - 1420	***Reservoir Management & Optimization***: *Using Simulation or Reservoir Management Decisions*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0830	***Advanced Simulation Techniques***: *Exploring Complex Simulation Methods like Compositional Simulation*
0830 - 0930	***Integration of Reservoir Simulation with Field Data***: *Real-Time Data Integration & Model Updating*
0930 – 0945	*Break*
0945 – 1130	***Machine Learning & AI in Reservoir Modeling***: *The Role of Emerging Technologies in Reservoir Characterization*
1130 – 1230	***Challenges in Unconventional Reservoirs***: *Specific Modeling Considerations or Unconventional Resources*
1230 – 1245	*Break*
1245 – 1345	***Best Practices & Workflow Optimization***: *Streamlining Reservoir Modeling Processes*
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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