COURSE OVERVIEW DE0450-4D
Applied Reservoir Simulation

Course Title
Applied Reservoir Simulation



Course Date/Venue
November 09-12, 2026/Albatross Meeting Room, VOGO Abu Dhabi Golf Resort & Spa Formerly Westin Abu Dhabi Golf Resort & Spa, Abu Dhabi, UAE

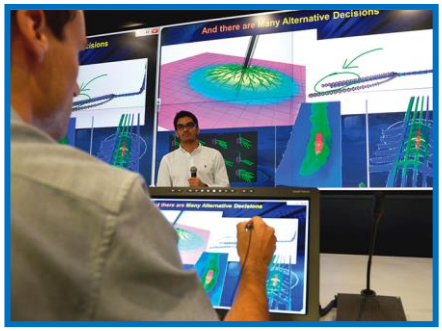
Course Reference
DE0450-4D

Course Duration/Credits
Four days/2.2 CEUs/22 PDHs

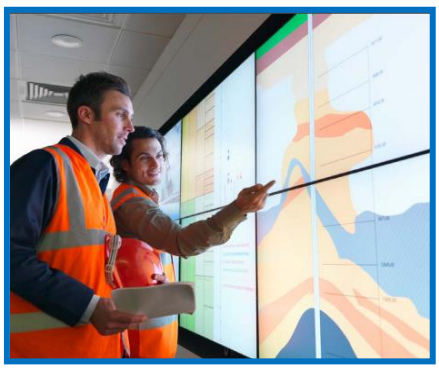
Course Description



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 Applied Reservoir Simulation. It covers the role of reservoir simulation in field development and reservoir management; the applications in reserves estimation, production forecasting and development planning; the reservoir engineering principles for simulation and reservoir rock and fluid data preparation; the grid design and reservoir model construction, upscaling and property assignment and model initialization and equilibration; and the numerical solution and simulation workflow, well modeling in reservoir simulation and production and injection control strategies.



Further, the course will also discuss how to run and diagnose reservoir simulation models; the fundamentals of history matching and advanced history-match techniques and analysis; the reservoir connectivity and dynamic behavior analysis and production forecasting using simulation models; the development scenario modeling, secondary recovery and pressure maintenance simulation; the simulation results visualization and interpretation; and the reservoir model uncertainty and sensitivity analysis.

During this interactive course, participants will learn the reservoir simulation for field development planning and enhanced oil recovery simulation concepts; using simulation models for surveillance and reservoir management; the bypassed hydrocarbons and under-drained reservoir areas; optimizing production and injection allocation; and updating simulation models with new field performance data.

Course Objectives/Outcomes & Benefits for the Participants

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

- Apply and gain an in-depth knowledge on applied reservoir simulation
- Discuss the role of reservoir simulation in field development and reservoir management and its applications in reserves estimation, production forecasting and development planning
- Identify reservoir engineering principles for simulation and apply reservoir rock and fluid data preparation
- Apply grid design and reservoir model construction, upscaling and property assignment and model initialization and equilibration
- Illustrate numerical solution and simulation workflow, well modeling in reservoir simulation and production and injection control strategies
- Run and diagnose reservoir simulation models and discuss the fundamentals of history matching
- Carryout advanced history-match techniques and analysis, reservoir connectivity and dynamic behavior analysis
- Apply production forecasting using simulation models, development scenario modeling, secondary recovery and pressure maintenance simulation
- Employ simulation results visualization and interpretation including reservoir model uncertainty and sensitivity analysis
- Explain reservoir simulation for field development planning and enhanced oil recovery simulation concepts
- Use simulation models for surveillance and reservoir management and identify bypassed hydrocarbons and under-drained reservoir areas
- Optimize production and injection allocation and update simulation models with new field performance data

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 applied reservoir simulation for experienced reservoir engineers. Participants shall have a basic knowledge of reservoir simulation, stochastic modelling, upscaling and some experience in the use of commercial reservoir simulators and other technical staff.

Training Methodology

Our courses employ an interactive, learner-centred methodology that integrates theoretical knowledge with practical application. The training is delivered through a suitable combination of some or all of the following methods, selected according to the course content and learning objectives:

- Instructor-led presentations and facilitated discussions
- Practical workshops and participant presentations
- Hands-on exercises and real-world case studies
- Equipment demonstrations and technical drawings
- Hardware- and software-based simulations
- Gamification & Role Play in soft-skills courses only
- Virtual Reality (VR) and Augmented Reality (AR)
- Instructional videos and other relevant training resources

This blended approach encourages active participation, strengthens practical skills and supports the effective application of acquired knowledge in the workplace.

Learning Design & Customization

This course can be customized to the exact requirements of clients. Haward Technology is so proud of our huge capabilities in tailoring our courses to the training needs of our valued clients.

Course Fee

US$ 6,750 per Delegate + **VAT**. 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

Haward's 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**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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 **2.2 CEUs** (Continuing Education Units) or **22 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. Stan Constantino, MSc, BSc, is a **Senior Petroleum & Reservoir Engineer** with over **30 years** of **Offshore & Onshore** extensive experience within the **Oil**, **Gas & Petroleum** industries**.** His area of expertise include **Reserves & Resources**, **Reserves Estimation & Uncertainty**, **Reservoir** Characterization, **Unconventional Resource & Reserves** Evaluation, **Oil & Gas Reserves** Estimation, Methods for **Aggregation of Reserves & Resources**, **Fractured Reservoir** Classification & Evaluation, **Sequence Stratigraphy**, **Petrophysics & Rock** Properties, **Seismic** Technology, **Geological** Modelling, **Water Saturation**, **Crude Oil & Natural Gas** Demand, **Exploration Agreements & Financial** Modelling, **Seismic Survey** Evaluation, **Exploration Well** Identification, **Field Production** Operation, **Field Development** Evaluation, Crude Oil Marketing, **Core & Log Data** Integration, **Core Logging**, Advanced **Core & Log Integration**, **Well Logs & Core Analysis**, Advanced Petrophysics/Interpretation of **Cased Hole Logs**, **Cased Hole Formation Evaluation**, **Cased Hole Formation** Evaluation, **Cased Hole Evaluation**, **Cased-Hole Logging**, Applied **Production Logging & Cased Hole & Production Log** Evaluation, **Cased Hole Logging & Formation** Evaluation, Open & Cased Hole Logging, Screening of Oil Reservoirs for **Enhanced Oil Recovery**, **Enhanced Oil Recovery**, **Enhanced Oil Recovery** Techniques, **Petroleum Economic** Analysis, **Oil Industry** Orientation, **Oil Production & Refining**, **Crude Oil Market**, **Global Oil Supply & Demand**, **Global Oil Reserves**, **Crude Oil** Types & Specifications, **Oil Processing**, **Oil Transportation-Methods**, **Oil & Gas** Exploration and Methods, **Oil & Gas** Extraction, Technology Usage in Industrial Security; **Upstream**, **Midstream** & **Downstream Operations**; **Oil Reservoir** Evaluation & Estimation, **Oil Supply & Demand**, **Oil Contracts**, **Government Legislation & Oil Contractual Agreements**, **Oil Projects** & Their Feasibility (revenue and profitability), **Water Flooding**, **Reservoir** Souring & Water Breakthrough, **Reservoir Performance** Using Classical Methods, **Fractured Reservoir** Evaluation & Management, **Reservoir Surveillance** & Management, **Reservoir Engineering** & Simulation, **Reservoir Monitoring**, **Pressure Transient** Testing & **Reservoir** Performance Evaluation, **Reservoir** Characterization, **Reservoir** Engineering Applications with ESP and Heavy Oil, **Reservoir** Volumetrics, Water Drive Reservoir, **Reserve** Evaluation, Rock & Fluid Properties, Fluid Flow Mechanics, PVT Analysis, Material Balance, Darcy's Law & Applications, Radial Flow, **Gas Well** Testing, Natural Water Influx, EOR Methods, Directional Drilling, **Drilling** Production & Operations, Field Development & Production of Oil & Gas, **Wireline Logging**, **Mud Logging**, **Cased Hole Logging**, **Production Logging**, **Slick Line**, **Coil Tubing**, Exploration Wells Evaluation, **Horizontal Wells**, **Well Surveillance**, **Well Testing**, **Design & Analysis**, **Well Testing & Oil Well Performance**, **Well Log Interpretation** (**WLI**), **Formation Evaluation**, **Well Workover Supervision**, **Pressure Transient Analysis** and **Petrophysical Log Analysis**. Currently, he is the **CEO** & **Managing Director** of **Geo Resources Technology** wherein he is responsible in managing the services and providing technical supports to underground energy related projects concerning **field development**, **production**, **drilling**, **reservoir engineering** and **simulation**.

Throughout his long career life, Mr. Stan has worked for many international companies such as the **Kavala Oil**, **North Aegean Petroleum Company** and **Texaco Inc.**, as the **Managing Director**, **Operations Manager**, **Technical Trainer**, **Training Consultant**, **Petroleum Engineering & Exploration Department Head**, **Assistant Chief Petroleum Engineer**, **Reservoir Engineer, Resident Petroleum Engineer**, **Senior Petroleum Engineer** and **Petroleum Engineer** wherein he has been managing the evaluation of exploration wells, reservoir simulation, development training, production monitoring, wireline logging and well testing including selection and field application of well completion methods.

Mr. Stan has a **Master's** degree in **Petroleum Engineering** and a **Bachelor's** degree in **Geology** from the **New Mexico Institute of Mining & Technology** (**USA**) and from the **Aristotelian University** (**Greece**) respectively. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership of Management (ILM**) and a member of the Society of Petroleum Engineers, USA (**SPE**), Society of Well Log Professional Analysts, USA (**SPWLA**) and European Association of Petroleum Geoscientists & Engineers (**EAGE**). Moreover, Mr. Stan published numerous scientific and technical papers and delivered various trainings, courses and workshops worldwide.

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: ***Monday, 09th of November 2026***

0800 – 0830	*Registration & Coffee*
0830 – 0845	*Welcome & Introduction*
0845 – 0900	***PRE-TEST***
0900 – 0930	***Introduction to Applied Reservoir Simulation*** *Role of Reservoir Simulation in Field Development & Reservoir Management • Applications in Reserves Estimation, Production Forecasting & Development Planning • Static Geological Models versus Dynamic Reservoir Simulation Models • Black-Oil, Compositional, Thermal & Specialized Simulation Approaches*
0930 – 0945	*Break*
0945 – 1030	***Reservoir Engineering Principles for Simulation*** *Material Balance, Fluid Flow & Conservation Principles • Darcy's Law & Multiphase Flow Through Porous Media • Reservoir Pressure, Saturation & Fluid Distribution • Drive Mechanisms & Their Influence on Dynamic Reservoir Behavior*
1030 – 1130	***Reservoir Rock & Fluid Data Preparation*** *Porosity, Permeability, Net-to-Gross & Rock Compressibility • PVT Properties of Oil, Gas & Formation Water • Relative Permeability & Capillary Pressure Relationships • Data Validation, Consistency Checking & Quality Control*
1130 – 1230	***Grid Design & Reservoir Model Construction*** *Cartesian, Corner-Point, Radial & Local Grid Configurations • Grid Resolution & Selection of Appropriate Cell Dimensions • Representation of Faults, Layers, Barriers & Flow Units • Grid Refinement, Coarsening & Computational Efficiency*
1230 – 1245	*Break*
1245 – 1300	***Upscaling & Property Assignment*** *Geological-to-Simulation Model Upscaling Workflow • Porosity, Permeability & Saturation Property Upscaling • Transmissibility Calculation & Intercell Flow Representation • Preserving Geological Heterogeneity & Dynamic Connectivity*
1300 – 1350	***Model Initialization & Equilibration*** *Initial Reservoir Pressure & Fluid Contact Definition • Oil-Water, Gas-Oil & Transition-Zone Initialization • Saturation Initialization Using Capillary Pressure Relationships • Initial Hydrocarbon-in-Place Verification & Model Quality Checks*
1350 – 1400	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1400	*Lunch & End of Day One*

Day 2: **Tuesday, 10th of November 2026**

0800 – 0830	***Numerical Solution & Simulation Workflow*** *Governing Equations for Multiphase Reservoir Flow • Finite-Difference Discretization & Numerical Solution Concepts • Time-Step Selection, Convergence & Numerical Stability • Simulation Workflow From Model Setup to Result Interpretation*
0830 – 0900	***Well Modeling in Reservoir Simulation*** *Producer & Injector Representation Within Simulation Models • Well Completion Intervals, Perforations & Connection Factors • Bottom-Hole Pressure, Production Rate & Injection Constraints • Vertical, Deviated, Horizontal & Multilateral Well Modeling*
0900 – 0915	*Break*
0915 – 1045	***Production & Injection Control Strategies*** *Oil, Gas & Water Production Rate Controls • Water & Gas Injection Operating Constraints • Pressure Maintenance & Voidage Replacement Strategies • Well Shut-In, Workover & Operational Constraint Representation*
1045 – 1230	***Running & Diagnosing Reservoir Simulation Models*** *Preparing Simulation Input Data & Defining Run Controls • Reviewing Initialization & Simulation Diagnostic Messages • Identifying Convergence Problems & Numerical Instabilities • Troubleshooting Material Balance & Simulation Run Failures*
1230 – 1245	*Break*
1245 – 1300	***Fundamentals of History Matching*** *Objectives, Philosophy & Workflow of History Matching • Matching Reservoir Pressure & Field Production History • Matching Individual Well Oil, Gas & Water Performance • Selection of Uncertain Reservoir Parameters for Adjustment*
1300 – 1350	***Practical History-Matching Techniques*** *Adjusting Permeability, Porosity & Transmissibility Multipliers • Modifying Relative Permeability & Aquifer Parameters • Investigating Well Productivity & Connectivity Discrepancies • Achieving Technically Reasonable Matches Without Overfitting*
1350 – 1400	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1400	*Lunch & End of Day Two*

Day 3: **Wednesday, 11th of November 2026**

0800 – 0830	***Advanced History-Match Analysis*** *Field-Level versus Well-Level History-Match Assessment • Pressure, Water-Cut, Gas-Oil Ratio & Production-Rate Matching • Diagnosing Timing, Magnitude & Trend Mismatches • Maintaining Geological Consistency During Model Calibration*
0830 – 0900	***Reservoir Connectivity & Dynamic Behavior Analysis*** *Identifying Communication Between Wells & Reservoir Compartments • Evaluating Fault Transmissibility & Flow Barriers • Understanding Water & Gas Movement Through the Reservoir • Assessing Pressure Depletion & Reservoir Drainage Patterns*

0900 – 0915	Break
0915 – 1045	***Production Forecasting Using Simulation Models*** *Establishing Forecast Assumptions & Operating Constraints • Base-Case Production Forecast Development • Predicting Oil, Gas, Water & Reservoir Pressure Performance • Estimating Recovery Factor & Remaining Recoverable Volumes*
1045 – 1230	***Development Scenario Modeling*** *Evaluating Infill Drilling & Additional Producer Scenarios • Assessing New Injector Locations & Injection Strategies • Comparing Vertical versus Horizontal Well Development Concepts • Evaluating Well Spacing, Timing & Production Constraints*
1230 – 1245	Break
1245 – 1300	***Secondary Recovery & Pressure Maintenance Simulation*** *Waterflood Design & Simulation Methodology • Injection-Production Pattern Selection & Optimization • Sweep Efficiency, Breakthrough & Displacement Performance • Gas Injection & Reservoir Pressure Maintenance Applications*
1300 – 1350	***Simulation Results Visualization & Interpretation*** *Reviewing Pressure, Saturation & Fluid Movement Maps • Interpreting Field, Group & Individual Well Performance Plots • Analyzing Water Breakthrough & Gas Breakthrough Behavior • Translating Simulation Outputs into Reservoir Management Decisions*
1350 – 1400	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1400	Lunch & End of Day Three

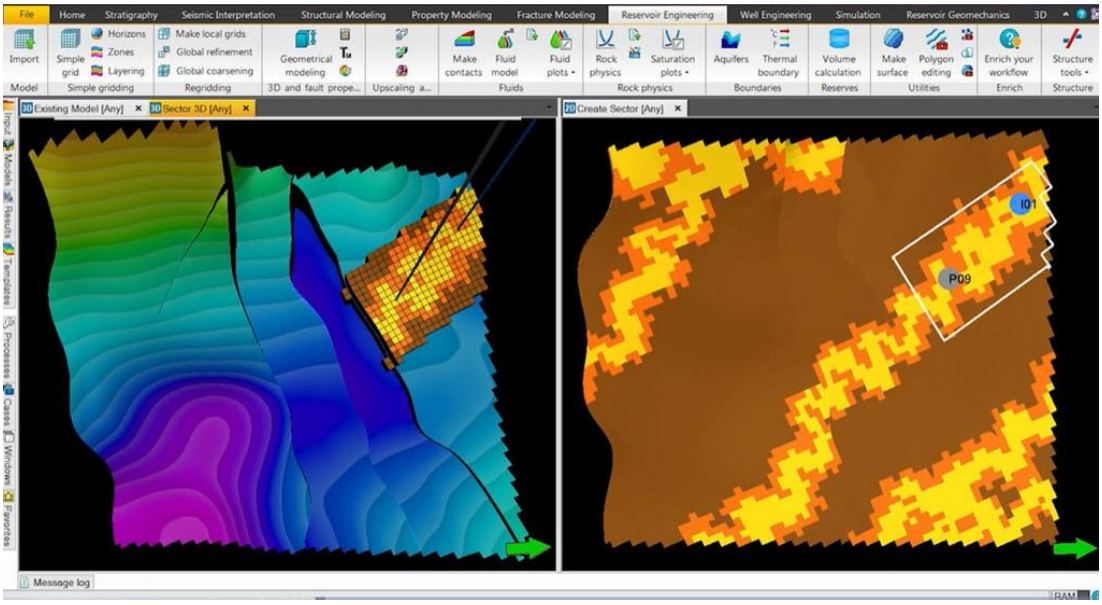
Day 4: Thursday, 12th of November 2026

0800 – 0830	***Reservoir Model Uncertainty & Sensitivity Analysis*** *Sources of Geological, Petrophysical & Dynamic Uncertainty • Identifying High-Impact Reservoir Simulation Parameters • Designing Systematic Sensitivity Simulation Cases • Quantifying Impacts on Production Forecasts & Recovery*
0830 – 0900	***Reservoir Simulation for Field Development Planning*** *Integrating Simulation Results into Field Development Plans • Optimizing Well Count, Location, Trajectory & Completion Strategy • Evaluating Production Facilities & Reservoir Constraints • Comparing Alternative Development Concepts & Depletion Strategies*
0900 – 0915	Break
0915 – 1045	***Enhanced Oil Recovery Simulation Concepts*** *Screening Reservoirs for Enhanced Recovery Opportunities • Miscible & Immiscible Gas Injection Simulation Concepts • Water-Alternating-Gas Injection Modeling Principles • Polymer, Chemical & Thermal Recovery Simulation Overview*
1045 – 1230	***Reservoir Management & Production Optimization*** *Using Simulation Models for Surveillance & Reservoir Management • Identifying Bypassed Hydrocarbons & Under-Drained Reservoir Areas • Optimizing Production & Injection Allocation • Updating Simulation Models with New Field Performance Data*
1230 – 1245	Break

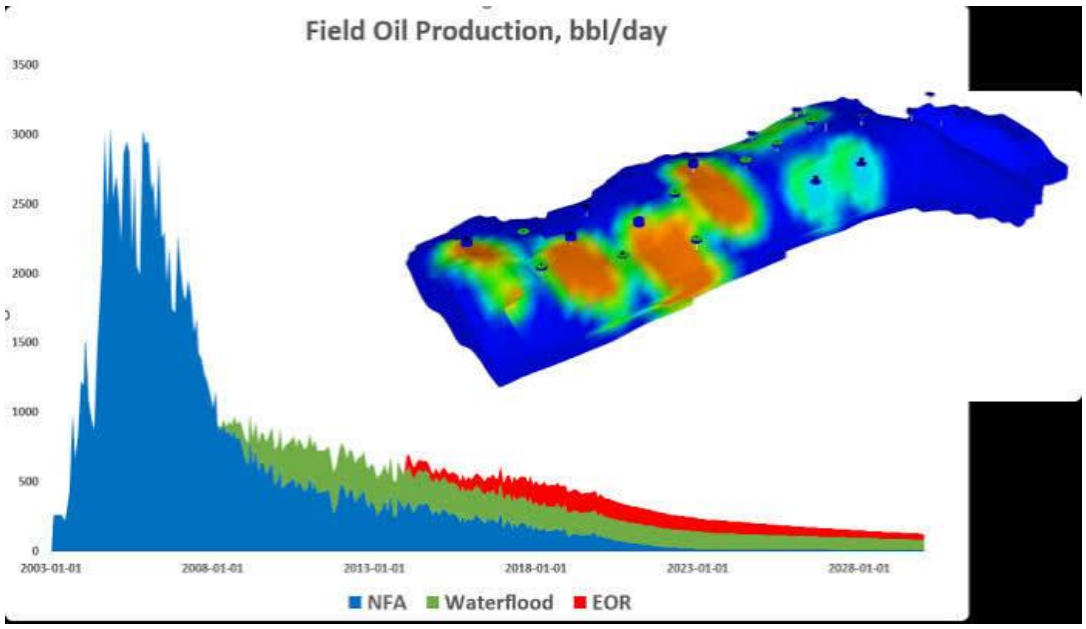
1245 – 1300	***Applied Reservoir Simulation Case Study*** *Building an Integrated Simulation Model from Reservoir Data • Initializing the Model & Validating Hydrocarbons in Place • History Matching Pressure, Production & Fluid Behavior • Running Alternative Development & Production Forecast Scenarios*
1300 – 1315	***Simulation Model Review, Reporting & Decision Support*** *Quality Assurance & Technical Review of Simulation Models • Documenting Assumptions, Limitations & Model Uncertainties • Preparing Simulation Results, Forecasts & Technical Reports • Presenting Simulation Findings to Support Field Development Decisions*
1315 – 1330	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1330 – 1345	***POST-TEST***
1345 – 1400	*Presentation of Course Certificates*
1400	*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 "Eclipse Software" & "CMG Suite 2015".



Eclipse Software



CMG Suite 2015

Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org