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COURSE BROCHURE

Dynamic Reservoir Simulation and History Matching Training Course

30 November – 4 December 2026
Casablanca

Dynamic Reservoir Simulation and History Matching Training Course

Ref: 2121_78157 **Date:** 30 November – 4 December 2026 **Location:** Casablanca **Fees:** 4900 GBP

Dynamic Reservoir Simulation and History Matching is a 1-week training course for reservoir engineers who build, calibrate and run flow models, ending with a History-Matched Forecast Case each participant assembles. Field development decisions, reserves bookings and infill drilling now lean on simulation results, so a model that matches production poorly can misdirect wells and facilities. Jupiter Prime Training runs this course for engineers who need models their asset teams can trust.

Why Dynamic Reservoir Simulation and History Matching Matters Now

Three pressures shape reservoir simulation today. Mature oil fields need infill, waterflood and gas injection decisions taken on models that honour decades of production. Gas storage and carbon storage projects ask the same flow equations to predict pressure and plume behaviour. Asset and finance stakeholders also expect forecasts expressed as ranges rather than single lines. An organisation with disciplined models chooses wells and facility sizes with confidence; one with weak calibration drills poor locations. The course rests on material balance, Darcy flow and the black-oil and compositional fluid formulations used across the industry.

Who Gains Most from Dynamic Reservoir Simulation and History Matching

- Engineers responsible for building and updating full-field flow models
- Engineers preparing production forecasts for development and reserves studies
- Engineers designing waterflood, gas injection and infill well scenarios
- Engineers converting static geological grids into dynamic models
- Engineers reviewing contractor simulation studies on behalf of an asset

A subsurface asset group that sends its geomodellers and reservoir engineers together gains most through smoother static-to-dynamic handover.

Dynamic Reservoir Simulation and History Matching Capabilities

Participants move from grid and fluid inputs to calibrated forecasts and defensible uncertainty ranges.

- Design grids and upscaling choices that preserve flow behaviour — model resolution
- Specify PVT and relative permeability inputs that suit the reservoir fluid — fluid formulation
- Test initialisation and equilibration against measured contacts and pressures — model quality
- Calibrate well models and productivity against well test results — well performance
- Apply structured history matching to pressure, water cut and gas-oil ratio — model credibility
- Build probabilistic forecast ranges from uncertainty runs — development decisions

Key Dynamic Reservoir Simulation and History Matching Terms

- History matching — adjusting model parameters until simulated pressures and rates reproduce observed field production.
- Relative permeability — the reduced ability of one fluid phase to flow when other phases share the pore space.
- PVT model — the description of how reservoir fluid volume, phase and properties change with pressure and temperature.
- Initialisation — setting the starting pressure, saturation and contact positions of a model before any production is simulated.
- Upscaling — converting fine geological cell properties into coarser simulation cells while keeping representative flow behaviour.
- Well index — the factor linking a well's flowing pressure to the pressure of the grid cell it penetrates.

Dynamic Reservoir Simulation and History Matching Day by Day

Day 1: Simulation Foundations and Model Purpose

- Material Balance and Darcy Flow Equations — Basis for Numerical Models
- Finite Difference Discretisation — Time Step and Stability Choices
- Black-Oil Versus Compositional Formulation — Matching Model to Fluid Type
- Model Objective Statement — Scope Set by the Development Question
- Simulation Study Workflow — Sequence From Grid to Forecast

Day 2: Grids, Rock and Fluid Inputs

- Corner-Point and Cartesian Grids — Resolving Faults and Layering
- Permeability and Porosity Upscaling — Retaining Heterogeneity in Coarse Cells
- PVT Table Preparation — Laboratory Data Into Simulator Format
- Relative Permeability and Capillary Pressure Curves — Saturation Function Selection
- Rock Typing and Saturation Regions — Assigning Functions Across Facies

Day 3: Initialisation and Well Models

- Equilibration Methods — Contacts, Pressure Gradients and Transition Zones
- Aquifer Models — Representing Pressure Support From Outside the Grid
- Well Index and Completion Modelling — Linking Wells to Grid Cells
- Vertical Lift Performance Tables — Tubing Constraints on Well Rates
- Production and Injection Controls — Rate, Pressure and Group Limits

Day 4: History Matching and Forecasting

- Match Parameter Sensitivity Screening — Selecting Uncertain Inputs to Adjust
- Pressure and Phase Rate Matching — Field, Region and Well Levels
- Assisted History Matching Methods — Objective Functions and Multiple Matches
- Forecast Case Definition — Infill, Waterflood and Gas Injection Scenarios
- Experimental Design for Uncertainty Runs — Low, Mid and High Outcomes

Day 5: Practising the History-Matched Forecast Case

- Sector Model Build Exercise — Applying Grid and Fluid Choices
- Initialisation Quality Check — Comparing Model Against Measured Pressures
- Well Group Match Exercise — Water Cut and Gas-Oil Ratio Calibration
- Gas Storage Cycle Scenario — Testing the Model Beyond Oil Production
- History-Matched Forecast Case Completion — Match Quality, Ranges and Recommendations

Applying Dynamic Reservoir Simulation and History Matching After the Course

- Run a parameter sensitivity screen on an existing field model and document which inputs drive the match.
- Prepare low, mid and high forecast cases for one pending infill or injection decision using an experimental design.

Dynamic Reservoir Simulation and History Matching Questions FAQ

What is Dynamic Reservoir Simulation and History Matching and why does it matter now?

It is the practice of building numerical flow models and calibrating them to observed production. Mature field redevelopment and storage projects depend on these models, so poor calibration leads directly to poor well and facility choices.

Which roles gain most from Dynamic Reservoir Simulation and History Matching?

Reservoir engineers who build or review flow models gain most. That includes engineers preparing development forecasts, designing injection schemes and checking contractor studies.

How does Dynamic Reservoir Simulation and History Matching differ from a static reservoir modelling course?

It starts where static modelling ends. You take a geological grid and add fluids, wells and time, then calibrate the model to production rather than to logs and seismic interpretation.

What do you bring back from Dynamic Reservoir Simulation and History Matching?

You bring back a forecast case built on a calibrated sector model. It records match quality, key uncertain parameters and low, mid and high outcomes.

Dynamic Reservoir Simulation and History Matching: The Way Forward

The History-Matched Forecast Case first informs whether a proposed infill or injection project proceeds. Reservoir engineers maintain it, while asset leaders and planners use its ranges when sizing wells and facilities. After its first use, the choice of match parameters is worth revisiting, because new production often shows which uncertainties were truly controlling the reservoir response.