

Reservoir Engineering Fundamentals Training Course

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Johannesburg

AGILE LEADERS
Training Center

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Overview

Reservoir Engineering Fundamentals Training Course is a one-week foundation course for early-career reservoir, petroleum, production, subsurface, and asset engineers who leave with a Reservoir Engineering Fundamentals Workbook. Participants connect rock and fluid properties, hydrocarbons in place, pressure behavior, reservoir drive mechanisms, material balance, well productivity, surveillance, and introductory forecasting through structured calculations and asset decisions. Agile Leaders Training Center presents reservoir engineering fundamentals for practical field-development support.

Who Should Attend

- Reservoir functions responsible for volumes, pressure trends, recovery, and forecasts
- Production functions responsible for well performance, inflow, and surveillance evidence
- Subsurface functions responsible for integrating geology, fluids, pressure, and production data
- Asset functions responsible for development assumptions, uncertainty, and decision records
- Technical-support functions responsible for calculations, data quality, and multidisciplinary reviews

The course assumes participants can use basic algebra, spreadsheets, and field data, and it leaves out advanced simulation, specialist well-test interpretation, detailed waterflood design, EOR design, and petrophysical interpretation.

Departments and Industries

The course supports departments and industries that evaluate porous-fluid systems and production performance.

- Oil and gas reservoir and production engineering
- Subsurface studies and field-development planning
- Energy asset management and reserves support
- Geothermal reservoir and production teams
- Underground gas storage technical teams

Learning Objectives

By the end of this course, participants will be able to:

- Apply rock, fluid, PVT, and saturation concepts
- Build volumetric hydrocarbons-in-place estimates with uncertainty
- Analyze Darcy flow, radial flow, and pressure behavior
- Use drive-mechanism and material-balance evidence
- Evaluate well productivity, decline trends, and surveillance data
- Build an introductory reservoir forecast and development decision record

Course Agenda

Day 1: Establish Reservoir Inputs

- Reservoir Rock Porosity, Permeability, and Saturation Worksheet
- Fluid PVT Property and Phase-Behavior Reference Sheet
- Net Pay, Area, Thickness, and Data-Quality Register
- Uncertainty Range and Assumption Classification Matrix
- Reservoir Engineering Unit-Conversion and Data Check

Day 2: Calculate Volumes and Flow

- Oil and Gas Volumetric Hydrocarbons-in-Place Worksheet
- Reserves, Resources, Recovery-Factor, and Uncertainty Bridge
- Darcy Flow Rate and Pressure-Drop Calculation
- Radial Flow Geometry and Wellbore Pressure Profile
- Volumetric Sensitivity and Scenario Comparison Table

Day 3: Diagnose Reservoir Energy

- Pressure History and Depletion Trend Plot
- Solution-Gas, Gas-Cap, Water, Gravity, and Combination Drive Matrix
- Material-Balance Conservation and Tank-Model Worksheet
- Production, Injection, and Pressure Surveillance Dashboard
- Well-Test Indicator and Escalation Checklist

Day 4: Connect Wells to Development

- Productivity Index and Inflow Performance Relationship Sheet
- Decline-Curve Trend and Forecast Boundary Worksheet
- Waterflood and EOR Screening Context Matrix
- Reservoir Surveillance Exception and Action Register
- Development Concept, Well Count, and Uncertainty Decision Map

Day 5: Practice Reservoir Decisions

- Suggested Exercise: Validate Rock, Fluid, and Saturation Inputs
- Suggested Exercise: Calculate In-Place Volumes and Recovery Ranges
- Suggested Exercise: Diagnose Drive Mechanism from Field Evidence
- Suggested Exercise: Build a Well and Reservoir Production Forecast
- Capstone Exercise: Complete the Reservoir Engineering Fundamentals Workbook

Practical Exercises

The course uses suggested activities to connect calculations, surveillance evidence, and development choices.

- Suggested activity: screen rock, fluid, pressure, production, and uncertainty inputs before calculation.
- Suggested activity: reconcile volumetric, material-balance, productivity, and decline evidence for a field case.
- Suggested activity: compare recovery and development scenarios without performing detailed simulation or EOR design.
- Suggested activity: assemble assumptions, calculations, plots, exceptions, and decisions in the course workbook.

FAQs

Who suits reservoir engineering fundamentals training, and what does it assume?

Reservoir engineering fundamentals training suits early-career reservoir, petroleum, production, subsurface, asset, and technical-support engineers. It assumes basic algebra, spreadsheet use, and familiarity with field data.

How does reservoir engineering fundamentals training differ from advanced reservoir simulation?

Reservoir engineering fundamentals training uses hand calculations, simple worksheets, pressure and production evidence, and introductory forecasts. Advanced reservoir simulation builds and calibrates numerical models for detailed prediction.

How are hydrocarbons in place estimated in reservoir engineering?

Hydrocarbons in place are estimated from reservoir area, net thickness, porosity, fluid saturation, and fluid-volume factors, with ranges used to show input uncertainty.

What do reservoir drive mechanisms indicate?

Reservoir drive mechanisms indicate which natural energy sources move fluids toward wells, including solution gas, gas cap, water influx, gravity drainage, or a combination.

Why is material balance used in reservoir engineering?

Material balance relates pressure, production, fluid expansion, influx, and injection through conservation of mass, helping engineers test in-place volume and drive assumptions.

Conclusion

Participants take back a Reservoir Engineering Fundamentals Workbook containing checked inputs, volumetric estimates, flow calculations, drive diagnostics, material-balance records, productivity analysis, surveillance plots, forecasts, and development decisions. The workbook changes disconnected field data into a traceable engineering basis. It supports onboarding, technical reviews, asset discussions, and selection of further specialist studies.