Petrogenium. Academy

Upstream (Reservoir Engineering)

Advanced Reservoir Engineering

Consultant / Trainer

Wim Swinkels/Thorsten Viertel

The **Petrogenium (in collaboration with EPTS) Advanced Reservoir Engineering** course provides a deeper understanding of both fundamental and advanced reservoir engineering concepts, which are essential for handling, analyzing, and interpreting subsurface and production data in the E&P (exploration and production) business. They will learn about the key tools used by modern reservoir engineers and have opportunities to practice applying these tools in real-world scenarios. This will enable them to contribute more effectively to field development plans and optimize the economic production of hydrocarbons.

Participants

This **Petrogenium.** course designed for Reservoir Engineers with a few years of practical experience and Petroleum Engineers and Geoscientists that require more than general knowledge of reservoir engineering.

Learning Objectives

At the end of the Advanced Course participants will have a deeper knowledge of modern reservoir engineering principles and practices for reservoir development and production, including the estimation of oil and gas reserves. They will also have an awareness of the construction and use of reservoir models. A broad spectrum of modern practical reservoir engineering methods are addressed. Extensive use is made of practical and actual field problems to illustrate relevant subjects.

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Learning Objectives

Course content

- Reservoir rock properties.
- Capillary pressures, surface tension, wettability, capillary pressure normalisation.
- Distribution of hydrocarbon fluids, pressure regimes, fluid gradients and contacts
- Hydrocarbons-in-place estimation
- The SPE PRMS and SEC system for reserves and resource classification and estimation
- Fluid properties and phase behaviour, PVT correlations, fluid sampling and laboratory procedures
- Recovery drive-energy, material balance equations, aquifer models and straight line methods.
- Gas reservoir engineering concepts.
- Radial flow equations and well behaviour
- Skin: source and how to minimize it.
- Theory and practice of oil and gas well testing and pressure analysis techniques.
- Design and interpretation of pressure transient well tests
- Production forecasting and Decline Curve Analysis
- Relative permeability, Corey model, movable oil
- Immiscible, incompressible and the Buckley Leverett 1D displacement theory, application to water flooding. Mobility ratio
- Determination of fractional flow curves and oil recovery.
- Reservoir simulation modelling principles
- Secondary recovery and EOR principles
- Field Development Planning
- Carbonate and fractured reservoirs
- Handling uncertainty

Programme

Day 1

Fluid behaviour and fluid modeling

1. Course Introduction
2. Fundamentals recap
3. Capillary pressure and saturation height relations, Leveret-J function
4. Distribution of hydrocarbon fluids
5. Exercise: permeability averaging and water breakthrough
6. Laboratory experiments, constant volume depletion, differential liberation
7. .
8. PVT & fluid sampling
9. Exercise PVT correlations for oil and gas

Day 2

Reserves and DCA methods

1. Reserves Classification systems- the SPE Petroleum Resource Management System
2. The probabilistic method
3. Decline Curve Analysis and Production forecasting
4. Exercise: oil production forecasting

Why select Petrogenium.?

The above support will be provided by principal consultants with 30+ years world-class experience in the technology and hands-on know-how from operation of refinery units.

Because Experience Matters

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Website:https://www.petrogenium.com/training/

Programme

Day 3

Reservoir models, wells. well behaviour and well tests

1. Oil and Gas Material Balance, aquifers, straight line methods
2. Wells, inflow performance, skin, horizontal wells
3. Exercise: use of well inflow calculations
4. Exercise: gas production forecasting
5. Modern well test analysis, Pressure Draw Down and Build Up analysis

Day 4

Displacement, sweep, flow and reservoir modelling

1. Relative permeability and capillary pressure, wettingness, drainage vs. imbibition
2. Displacement and Recovery, sweep, heterogeneity, Buckley-Leverett, movable oil
3. Pseudo relative permeability
4. Exercise mobility ratio
5. Reservoir Simulation - modelling construction and history matching, QA/QC
6. Reading and discussion of simulation field cases

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Day 5

Recovery and development planning

1. Fractured reservoirs
2. Secondary Recovery, Enhanced Oil Recovery
3. Oil Field Development Planning
4. Gas field development planning
5. Exercise: development planning regulations
6. Handling uncertainty
7. Course Recap, Quiz and Evaluation

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