QUEST
Professional Center

PROFESSIONAL TRAINING COURSE

Course No. 1857

Reservoir Engineering and Enhanced Oil Recovery (EOR) Training Course

UPSTREAM OPERATIONS, EXPLORATION, DRILLING, RESERVOIR & PRODUCTION
OIL & GAS

DURATION
5 Days

DELIVERY
Classroom

Course Overview

This advanced training course provides a comprehensive understanding of reservoir engineering principles and Enhanced Oil Recovery (EOR) technologies used to evaluate reservoir performance, optimize hydrocarbon recovery, and extend the productive life of oil and gas fields. The course integrates reservoir characterization, fluid behavior, pressure analysis, material balance, well performance, and recovery mechanisms into a practical framework for reservoir management and field development.

Participants will examine the relationship between reservoir properties, rock and fluid characteristics, pressure behavior, well performance, and recovery efficiency. The course addresses key reservoir engineering techniques used to assess reserves, understand reservoir drive mechanisms, forecast production, identify remaining hydrocarbon potential, and support technically sound field development decisions.

A major focus is placed on secondary and enhanced recovery methods, including water flooding, gas injection, miscible and immiscible displacement, thermal recovery, chemical flooding, and other EOR approaches. Participants will learn how to evaluate reservoir suitability for different recovery methods, assess injection strategies, analyze displacement efficiency, and identify operational and economic factors that influence EOR project performance.

The course emphasizes practical decision-making through reservoir surveillance, production and pressure data analysis, performance forecasting, injection management, and EOR project evaluation. Through case studies and integrated exercises, participants will develop strategies to increase recovery factors, improve sweep efficiency, optimize injection programs, manage reservoir uncertainty, and maximize the economic value of mature and challenging oil reservoirs.

Objectives

- By the end of the course, participants will be able to:
- Analyze fundamental reservoir engineering principles and their application to field development.
- Evaluate reservoir rock and fluid properties and their influence on hydrocarbon recovery.
- Analyze reservoir pressure behavior and identify dominant reservoir drive mechanisms.
- Apply material balance concepts to evaluate reservoir performance and hydrocarbon volumes.

- Evaluate well and reservoir performance using production and pressure data.
- Assess primary and secondary recovery mechanisms and their limitations.
- Compare Enhanced Oil Recovery methods and determine their suitability for specific reservoirs.
- Evaluate water flooding and gas injection strategies to improve sweep and displacement efficiency.
- Analyze the technical requirements and operating considerations of chemical and thermal EOR methods.
- Develop reservoir surveillance strategies to monitor injection and recovery performance.
- Evaluate EOR project risks, uncertainties, technical constraints, and performance indicators.
- Develop integrated reservoir optimization and EOR strategies to improve recovery and field value.

Who Should Attend

This course is designed for reservoir engineers, petroleum engineers, production engineers, drilling and completion professionals, geoscientists, and technical specialists involved in reservoir evaluation, field development, production optimization, and Enhanced Oil Recovery projects.

It is particularly relevant for professionals responsible for reservoir characterization, reserves evaluation, production forecasting, pressure and performance analysis, water flooding, gas injection, EOR studies, reservoir surveillance, and field development planning.

The course is also suitable for reservoir and asset managers, field development specialists, technical managers, production optimization teams, and decision-makers responsible for maximizing recovery, extending field life, evaluating mature assets, and making investment and development decisions related to secondary and enhanced recovery projects.

Learning Outcomes

- Upon completion of this course, participants will be able to:
- Explain the fundamental concepts and principles of reservoir engineering.
- Evaluate key reservoir rock and fluid properties affecting hydrocarbon recovery.
- Analyze reservoir pressure behavior and identify reservoir drive mechanisms.

- Apply material balance concepts to reservoir performance evaluation.
- Interpret production, pressure, and well performance data.
- Assess primary and secondary recovery performance and identify recovery limitations.
- Evaluate reservoir conditions for water flooding and gas injection.
- Analyze displacement, sweep, and recovery efficiency.
- Compare major EOR technologies and identify appropriate applications.
- Evaluate chemical, thermal, miscible, and gas-based EOR opportunities.
- Develop reservoir surveillance and performance monitoring strategies.
- Identify injection and production constraints affecting EOR performance.
- Evaluate technical risks and uncertainties associated with EOR projects.
- Develop strategies for improving injection efficiency and reservoir sweep.
- Support EOR project screening, selection, implementation, and performance evaluation.
- Develop integrated reservoir management strategies to maximize ultimate recovery.

Course Outline

DAY 01

Reservoir Engineering Fundamentals and Reservoir Characterization

- Fundamentals of reservoir engineering and its role in field development.
- Reservoir rock properties: porosity, permeability, saturation, and heterogeneity.
- Reservoir fluid properties and phase behavior.
- Pressure, temperature, and fluid distribution within reservoirs.
- Reservoir characterization and geological uncertainty.
- Hydrocarbon reserves and recovery factor concepts.

> **PRACTICAL APPLICATION**
>
> Evaluate a representative reservoir dataset and identify the key properties controlling production and recovery potential.

DAY 02

Reservoir Performance Analysis and Recovery Mechanisms

- Reservoir pressure behavior and pressure depletion.
- Primary recovery mechanisms and reservoir drive systems.
- Material balance principles and applications.
- Production decline analysis and reservoir performance trends.
- Well performance and inflow behavior.
- Reservoir surveillance using pressure, production, water cut, and gas-oil ratio data.
- Identifying remaining hydrocarbon potential and production constraints.

> **PRACTICAL APPLICATION**
>
> Analyze reservoir pressure and production trends to determine reservoir drive mechanism and remaining recovery opportunities.

DAY 03

Secondary Recovery, Water Flooding and Gas Injection

- Principles and objectives of secondary recovery.
- Water flooding design concepts and injection strategies.
- Injection patterns, well spacing, and sweep efficiency.
- Water-oil mobility ratio and displacement efficiency.
- Water breakthrough, channeling, conformance, and reservoir heterogeneity.
- Gas injection principles and reservoir applications.
- Pressure maintenance and injection performance monitoring.

> **PRACTICAL APPLICATION**
>
> Develop a preliminary water flooding or gas injection strategy for a representative reservoir.

DAY 04

Enhanced Oil Recovery Technologies

- Fundamentals and classification of Enhanced Oil Recovery methods.
- Miscible and immiscible gas injection.
- Carbon dioxide and hydrocarbon gas injection concepts.
- Chemical EOR: polymer, surfactant, and alkaline flooding.
- Thermal recovery methods and their applications.
- Steam injection and thermal reservoir behavior.
- EOR screening criteria based on reservoir depth, temperature, viscosity, permeability, fluid properties, and heterogeneity.
- Technical challenges, operating risks, and implementation considerations.

> **PRACTICAL APPLICATION**
>
> Screen multiple EOR technologies and select the most appropriate recovery method for different reservoir conditions.

DAY 05

EOR Project Optimization, Surveillance and Field Implementation

- EOR project design, development strategy, and implementation planning.
- Injection optimization and reservoir pressure management.
- Monitoring displacement efficiency and sweep improvement.
- Reservoir surveillance and EOR performance indicators.
- Managing water breakthrough, gas breakthrough, conformance, and injection losses.
- Production forecasting and recovery factor improvement.
- Technical and economic considerations in EOR project evaluation.
- Risk, uncertainty, decision-making, and lifecycle reservoir management.

DAY 05 — CONTINUED

FINAL WORKSHOP

Develop an integrated reservoir management and EOR strategy covering reservoir assessment, recovery mechanism selection, injection design, surveillance, performance optimization, risk management, and long-term recovery improvement.

Register or Request More Information

Course page: https://quest-training.com/courses/reservoir-engineering-and-enhanced-oil-recovery-eor-training-course
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