Advanced Certificate

Miscible Gas EOR Certification

5 days **RENG/EOR-G**

Overview

LEVEL

Proficiency

PURPOSE

This course provides an in-depth understanding of Miscible Gas Enhanced Oil Recovery (EOR) methods, the corresponding displacement mechanisms and expected performance. Il also provides information about miscible gas EOR projects workflow based on the presentation of screening criteria and field cases.

LEARNING OBJECTIVES

Upon completion of the course, participants will be able to:

discuss the recovery expectations from reservoirs under primary, secondary and EOR methods,

discuss the mechanisms of various miscible gas EOR methods and related screening criteria,

list gas used in miscible gas EOR and compare the way they affect oil recovery,

design and apply miscible gas EOR methods by using empirical, analytical and simulation tools and evaluate their performance.

WAYS AND MEANS

Interactive lectures and exercises.

Field case studies.

Miscible gas EOR simulation using dedicated software.

Software used during workshops: with courtesy of Schlumberger.

LEARNING ASSESSMENT

Knowledge assessment with multiple choice questions and open explanatory questions.

PREREQUISITES

Basic knowledge in reservoir engineering, oil reservoirs drive mechanisms and reservoir simulation.

WHY AN IFP TRAINING CERTIFICATION?

- An international recognition of your competencies.
- A Advanced Certificate delivered.
- An expertise confirmed in Miscible Gas EOR Certification.
- Ready-to-use skills.

Agenda

REMINDERS OF OIL RESERVOIR DRIVE MECHANISMS — 0.5 d

Review of primary and secondary recovery drive mechanisms:
Natural depletion of undersaturated oil reservoir.
Solution gas drive.
Natural water drive.

Water and gas injection.
Principle and mechanisms of main EOR methods:
Chemical flooding.
Miscible gas flooding.
Thermal flooding.

DISPLACEMENT THEORY & FRACTIONAL FLOW

0.5 d

Factors affecting oil recovery.
Mobility ratio and sweep efficiency.
Fractional flow theory.
Oil recovery calculation in homogeneous and stratified reservoirs.

PHASE BEHAVIOR & FLUID PROPERTIES

1 d

Fundamentals of fluids properties. Phase envelope.
Fluid properties affected by miscible gas injection.
Ternary diagrams.

MISCIBLE GAS INJECTION METHODS (CO2, N2, HYDROCARBONS)

3 d

Principles and mechanisms of miscible gas EOR.
Minimum Miscibility Pressure (MMP).
Displacement mechanism.
First contact miscibility.
Condensing drive.
Vaporizing drive.
Screening criteria.
Laboratory experiments.
Miscible gas EOR design & workflow.
Miscible CO_2 flooding.
Miscible hydrocarbon flooding.
Simulation and performance evaluation of miscible gas flooding.
Case studies.