



DE319: Reservoir Engineering for Enhanced Oil Recovery (EOR)

Training Description:

The increasing demand of oil by the global industry develops very good opportunity for more applications of current and advanced enhanced oil techniques in mature oil fields. This intensive training course is designed to provide participants with comprehensive understanding of different design aspects, types, screening criteria, and field application of current, advanced, and emerging techniques of Enhanced Oil Recovery (EOR) processes.

The goal of this training course is to present basics, problems, advanced solutions, field applications of chemical, miscible, and thermal EOR methods, and emerging technologies of different EOR processes with actual field cases. Today, it is better to apply EOR in a secondary mode. Detailed advanced EOR methods of Steam Assisted Gravity Drainage (SAGD), Low Salinity (LSW), Vapor Extraction (VAPEX), microbial and enzyme, microwave, electric, and hybrid chemical-thermal-miscible methods will be discussed. All of these techniques suffer from several problems of accurate reservoir characterization, difficult screening actual severe heterogeneous reservoir, pilot design, and field implementations. This training course is designed as an interactive learning environment of lecturing, industry videos, and solved field cases.

The training course will highlight:

- Rock and Fluid Properties for better reservoir characterization
- Classify and Screen different EOR methods for current producing reservoirs
- Screen Actual Reservoir(s) to select the best EOR method for your reservoir
- Maximize Oil Recovery using chemical, miscible, and thermal EOR methods
- Know newly-developed EOR methods of Chemical, Thermal, Miscible, Hybrid EOR Methods
- Understand Microbial, Low Salinity Water, SAGD, VAPEX, THAI, Microwave, Electric Methods
- Understand different problems and proposed solutions of different EOR processes

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Describe different chemical, miscible, and thermal EOR processes
- ✓ Maximize oil recovery using Mobility Ratio and Capillary Number
- ✓ Apply reservoir characterization and screening actual fields for EOR
- ✓ Understand chemical, miscible, thermal, and hybrid EOR techniques
- ✓ Understand newly-developed EOR methods and compare with current ones

Training Designed for:

This course is intended for Petroleum, Production & Reservoir Engineers, Processing Engineers & other Discipline Engineers, Engineers who are new to the profession and other individuals who need to know about EOR technologies.

Training Requirement:

“Hands on practical sessions, equipment and software will be applied during the course if required and as per the client’s request.” Practical sessions will be organized during the course for participants to practice the theory learnt.

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

DAY ONE:

❖ Different EOR Processes and Screening Criteria

- Different Enhanced Oil Recovery (EOR) Methods
- Reservoir Concepts, Rock and Fluid Properties for EOR
- Screening Criteria and Mechanisms of Different EOR Methods
- Maximize Oil Recovery using Mobility Ratio and Capillary Number
- Limitations, Challenges and Problems of Different EOR Methods

DAY TWO:

❖ Reservoir Fluid Properties and Reservoir Characterization

- Reservoir Concepts, Main Rock and Fluid Properties for EOR
- Advanced Reservoir Characterization Techniques for EOR Methods
- Water Flooding: Design Requirement, Limitations, and Displacement Theory
- Polymer Flooding: Polymer Types, Properties, and Types of Degradation
- Polymer Flooding: Mobility Ratio (M), Slug Design, and Field Application

DAY THREE:

❖ Current Chemical and Miscible EOR Techniques

- Alkaline / Polymer and ASP Flooding: Process and Limitations
- Two Actual Field Results: Daqing (China) and Kentucky (USA)
- Miscible Gas EOR: CO₂, HC, and Nitrogen Injection Methods
- Lab and Numerical Determination of Minimum Miscibility Pressure
- Carbon Dioxide Miscible and Immiscible Flooding Processes

DAY FOUR:

❖ Current and Advanced Thermal EOR Processes

- Thermal Processes; Cyclic and Continuous Steam Injection
- Steam-Assisted-Gravity-Drainage (SAGD)
- In-situ Combustion Methods: Forward and Backward
- Toe-to-Heel Air Injection (THAI) and CAPRI Processes
- Steam-CO₂ Hybrid EOR Technique and Field Application

DAY FIVE:

❖ Other Advanced EOR Processes

- Microbial (MEOR) and Enzymes (EEOR) Processes
- Low Salinity Water (LSW) and Pulsed Water Processes
- Seismic, Electric, and Electromagnetic Heating EOR Methods
- Hybrid EOR Applications; CO₂-thermal and Chemical-thermal Methods

❖ Course Conclusion

❖ POST-ASSESSMENT and EVALUATION

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session

For training registrations or in-house enquiries, please contact:

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