

## Advanced Enhanced Oil Recovery

This 5-day course covers various aspects of enhanced oil recovery (EOR) with emphasis on practical aspects of current EOR techniques. For various EOR technology, the processes taking place at different scales is discussed and the various testing techniques, screening criteria, and previous practical findings are covered. The aim of the training course is to present fundamentals, drawbacks, practical solutions, and field applications of miscible, chemical, and thermal EOR methods. Detailed and comprehensive understanding of Low Salinity, CO<sub>2</sub> injection, Water-alternating-Gas (WAG) injection, Heavy oil EOR, Surfactant and Polymer methods will be discussed. Physic-based approaches for screening suitable systems for each EOR technique will be addressed. This training course is designed to interactively elaborate the up-to-date methodologies to design EOR applications from laboratory experiments to field purposes.

Pore-scale and core-scale processes leading to additional oil recovery in field scales will be explained. Various examples of laboratory experiments and simulation of EOR studies will be discussed. The importance of characterizing reservoir derive mechanisms, fluid, and rock properties is one of the focuses of this course. Hands-on practice of fundamental analyses for water-based EOR methods using Buckley Leverette fractional flow will be exercised.

### Key Learning Points

1. The range of EOR pore to field scale processes and how to evaluate the performance of different EOR methods.
2. Methods for screening different EOR methods
3. How to design the studies to attain pertinent parameters.
4. Find out how to model various scenarios of different EOR methods.

### Practical Applications

- Practical assessment of EOR (water and gas injection) scenarios for two fields
  - Light oil
  - Heavy oil
- Case studies -from lab to field applications

### Materials Provided

- Printed course materials will be provided in a booklet.

# Target audience

Petroleum, production, process, drilling engineers / operators / technicians / managers.

# Main content

- Day-1
  - Introduction to Enhanced oil recovery (EOR)
  - Practical aspects of water injection
  - Interpretation of waterflooding experiments
  - Relative permeability and capillary pressure
  - Gas injection EOR; immiscible and miscible gas injection
  - CO<sub>2</sub> injection
  - PVT experiments for EOR, identifying key data
  - Frontal instability and early breakthrough of gas
- Day-2
  - Water-alternating-gas (WAG) injection
  - Immiscible vs. miscible WAG
  - Laboratory experiments designed for WAG studies
  - Hysteresis effects in WAG
  - Practical review of WAG field cases
- Day-3
  - Low salinity water injection (Sandstone and Carbonate reservoirs)
  - Why it works
  - How it works
  - Where it works
  - How to identify best brine composition
- Day-4
  - Surfactant flooding
  - Polymer flooding
  - Practical aspects of chemical EOR
- Day-5
  - Introduction to heavy oil recovery
  - Review of field trails
  - Two case studies for light and heavy oils

# Instructor

Professor Bahman Tohidi and Dr. Pedram Mahzari

You can email [Prof. Tohidi](mailto:Prof.Tohidi) if you have any questions about the course content, or if you wish to see a specific topic to be added to the course.

# Booking

If you are interested in attending this course please email Hydrafact Ltd. at [info@hydrafact.com](mailto:info@hydrafact.com)

# Cost

£1,900

# Delivery options

The course can be tailored based on your specific requirement with respect to duration and contents and delivered in your offices.