

Enhanced Oil Recovery (EOR)



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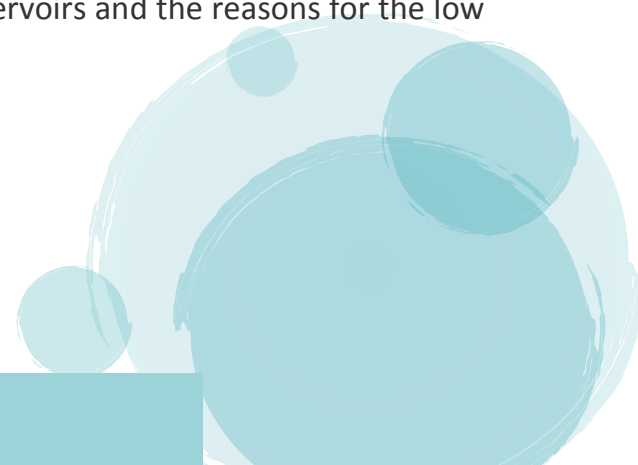
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Introduction:

As global exploration moves into harsher environments and remote places, finding new oil and its production gets more difficult and expensive. In the existing oil fields, as production rates are declining, improving recovery factor is becoming increasingly more important. Many of these reservoirs are approaching the end of their water flood life and are good candidate for EOR.

The global average recovery factor is estimated to be only around 30% of the oil in place which means that around 70% of the world's oil will be left behind once all the oil fields are shut in and abandoned. Therefore, there is a major prize to be gained by improving recovery factor in existing reservoirs through application of various EOR technologies. At Heriot-Watt University, we have more than 30 years' experience in researching and developing new EOR technologies.

The objective of this comprehensive 5-day training course is to discuss the fundamental mechanisms and applications of the processes related to EOR. Recent developments and new insights into Enhanced Oil Recovery by gas and WAG injection, water injection and low salinity water flood will be presented. The course will also cover the main properties of hydrocarbon reservoir rocks and fluids, main drive mechanisms in oil reservoirs and the reasons for the low recovery factor observed in majority of oil reservoirs.



Modelling and numerical simulation of oil reservoirs under EOR and shortcomings of the current models and formulations will be discussed. New methodologies will be presented for improving prediction of reservoir performance under EOR.

Participants of the course will also visit the state-of-the-art EOR laboratories within the Centre for Enhanced Oil Recovery and CO2 Solutions of Heriot-Watt University and will have a unique opportunity to see what sort of experiments and measurements are needed for designing an EOR process.

Course requirement

Degree in science or engineering or some experience with oil and gas recovery is desirable.

Who should attend?

Engineers, Geologists, Managers, Researchers and others interested or involved oil and gas recovery

Course Outline:

- Reservoir rock properties
 - Reservoir fluid properties
 - Reservoir drive mechanisms
 - Mechanisms of oil trapping and mobilisation
 - Mobility and mobility control
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- Immiscible and miscible processes
 - Water flooding
 - Gas injection
 - CO2 injection
 - Water alternating gas (WAG) injection
 - Simultaneous water and gas (SWAG) injection
 - Carbonated water injection (CWI)
 - Fluid/fluid and rock/fluid interactions during EOR
 - Alkaline and alkaline surfactant polymer (ASP) flooding

- Low salinity water injection
- Heavy and viscous oil recovery
- Laboratory testing of EOR techniques
- Numerical simulation of EOR and upscaling issues
- Determination of three-phase relative permeability (k_r) and hysteresis for
- EOR/EOR laboratory visit