28.8.17

TPG4150 RESERVOIR RECOVERY TECHNIQUES

Fall Semester 2017

Lectures: Wednesday 8:15-10 (P1), Wednesday 8:15-10 (P1)
Assisted exercises: Monday 13:15-14 (P13), Friday 11:15-12 (P1)
Final exam: Dec. 2, 9:00-13:00

The course deals with physics of petroleum reservoirs and computational methods for planning of recovery of oil and gas from such reservoirs. Main subjects include analysis of microscopic and macroscopic displacement processes and of internal and external energy sources and the effects of such energies on the recovery of oil and gas from various types of petroleum reservoirs and fluid systems.

Lecturer
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Teaching Assistant
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Supplementary Textbooks
Zolotukhin, A. B..: *Introduction to Petroleum Reservoir Engineering,* Høyskoleforlaget (2000) (not obligatory)
Dake, L.: *Fundamentals of reservoir engineering,* Elsevier, New York (1978) (not obligatory)

Handouts (handouts will be posted on home page during the semester)

The following topics are covered
•Review of rock and fluid properties
•Oil, gas and gas-condensate systems
•Material balance equations
•Natural drive mechanisms
•Microscopic and macroscopic displacement efficiency
•Fluid flow equations
•Reservoir types
•Injection of gas and water
•Well patterns
•Planning of production
•Improved oil recovery methods

Exercises
Obligatory calculation exercises, partly by use of computer, will be assigned.
A group project will be based on real field data.
Exercises count 25% on the final course grade.

Web-address (in addition to Blackboard)
http://www.petroleum.ntnu.no/~kleppe/TPG4150

Handout Notes (preliminary list)

- Handout note 1: J. Kleppe: "Material Balance Equations"
- Handout note 2: J. Kleppe: "Fluid Flow Equations"
- Handout note 3: J. Kleppe: "Review of Relative Permeabilities and Capillary Pressures"
- Handout note 4: J. Kleppe "Dykstra-Parson´s Method for Simplified Analysis of Oil Displacement by Water in a Layered Reservoir"
- Handout note 5: Buckley-Leverett Analysis for diffuse flow conditions
- Handout note 6: Dietz Analysis for segregated flow conditions

A number of exercises and a group project will be required during the semester