TPG4150 RESERVOIR RECOVERY TECHNIQUES

Fall Semester 2010

Lectures: Tuesday 12.15-14 (P1), Thursday 8.15-10 (P1)
Assisted exercises: Monday 14.15-16 (P1)

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
Professor Jon Kleppe (jon.kleppe@ntnu.no)

Assistants
5th year students Aida Kheradmand (kheradma@stud.ntnu.no) and
Yugal Kishore Maheshwari (maheshwa@stud.ntnu.no)

Textbooks
1. Dake, L.: *Fundamentals of reservoir engineering*, Elsevier, New York (1978)
(The book may be obtained from the department office)

2. Handouts

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. At least one of the exercises will be based on Gullfaks data and organized as group work (PBL)
Exercises count 40% on the final course grade.

Web-address
http://www.petroleum.ntnu.no/~kleppe/TPG4150

Preliminary list of required reading material

Textbook 1:   L.P. Dake: *Fundamentals of Reservoir Engineering*, Elsevier, Amsterdam, 1978

Handout Notes (preliminary)

- 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 will be required during the semester