

PET 571 – Applied Reservoir Simulation

3 credits, 3 class hours

Fall 2009

TR, 9:30-10:45

Tuesday in MSEC 367, Thursday in MSEC 395

Description: Unlike PETR 523 – Numerical Simulation which emphasizes the fundamental principles behind simulation; the proposed course will focus on applied simulation using available commercial software as a tool.

A series of examples (tutorials and others) will be given over the semester with the purpose of applying simulation tools to investigate various reservoir problems. The tutorials are progressive and are designed to teach the various components of the software program. After mastering each tutorial, each student will be given a modification to the original problem to simulate and explain his or her results. Lectures will follow each tutorial, explaining the fundamentals behind each one. A final field project will complete the semester.

Prerequisites: PET 445 or consent of instructor

Objectives:

1. To understand the versatility and limitations of simulation modeling by applying a commercial simulator to case studies, and appropriately evaluating the results.
2. Exposure to the mathematical background and formulation of numerical models.

References:

1. Recommended: Petroleum Reservoir Simulation by K. Aziz and A. Settari, (1979) Published by Aziz and Settari, **\$48.25** member, \$ 53.00 list
2. Recommended: Principles of Applied Reservoir Simulation by J.R. Fanchi 3rd Ed, Elsevier Publishing (2006) **\$84.95** member, \$93.95 list
3. Recommended: Reservoir Simulation by C.C. Mattax and R. L. Dalton, SPE Monograph Vol 13. (1990) **\$36.00** member, \$71 list
4. Required: Basic Applied Reservoir Simulation by T. Ertekin, J.H. Abou-Kassem, and G.R. King, SPE Textbook Series, (2001) **\$94.00** member, \$188 list

Assessment:

- Brief presentation and memo of modified tutorials
- Final field project – report and presentation (probably group project)

Tutorial 1: Standard usage

Tutorial 2: Building a model

Tutorial 3: Constructing a PEBI simulation grid (maybe)

Tutorial 4: History matching using ECLIPSE Office and SimOpt

Tutorial 5: Streamline Simulation (maybe)

Tutorial 6: Adding local grid refinement

Tutorial 7: Remote job submission (probably not)

Tutorial 8: Using property correlations

Tutorial 9: Using PEEP

Tutorial 10: Using the Coal Bed Methane template

Tutorial 11: Using the Completions Modeling Tool template