

**PTE 507 - ENGINEERING AND ECONOMIC
EVALUATION OF SUBSURFACE RESERVOIRS**

Fall 2013, Thur. 6:40-9:20 PM, OHE 122

Instructor: Ehsan Tajer, Ph.D., invited lecturer, email: tajer@usc.edu

Office Hours: 5:00-6:30 PM Thur. Office: HED 302

Teaching Assistant: Le Lu, email: lelu@usc.edu

Course Objectives: This graduate-level course is intended to introduce a broad range of economic and engineering subjects related to petroleum reservoirs. First, we will review the concepts of petroleum reserves, the time value of money and their applications for evaluating investment situations. These techniques can be used to systematically qualify the relative economic merits of investment opportunities. Later, we will review a number of analytical, empirical and numerical methods for estimating volumetric performances of petroleum reservoirs. Discussed subjects are listed in the *Course Outline*.

Prerequisites: Introductory courses in reservoir engineering and transport processes in porous media.*

Course Outline:

- Week 1: Course Overview, Petroleum Reserves Definition and Classification
- Week 2: Economic Evaluation- Deterministic Methods
- Week 3: Economic Evaluation- Probabilistic Methods
- Week 4: Reservoir Performance Forecasting Methods
- Week 5: Material Balance Applied to Oilfields
- Week 6: Fetkovich Decline Curve Analysis
- Week 7: Midterm Exam
- Week 8: Horizontal Wells
- Week 9: Water and Gas Coning
- Week 10: Gravity Drainage
- Week 11: Introduction to Naturally Fractured Reservoirs
- Week 12: Introduction to Reservoir Geomechanics
- Week 13: Term Project Presentation
- Week 14: Term Project Presentation

Exams:

Midterm Exam Oct. 10, 2013
Final Exam Dec. 12, 2013

*PTE 411x and PTE 464 or equivalent courses.

Textbook: Class notes and readings to be assigned.

Useful References:

M. A. Mian, "Project Economics and Decision Analysis, Vol. 1: Deterministic Models", 2nd Ed., PennWell Corp., 2011.
M. A. Mian, "Project Economics and Decision Analysis, Vol. 2: Probabilistic Models", 2nd Ed., PennWell Corp., 2011.
L. P. Dake, "The Practice of Reservoir Engineering", Elsevier, 2001.
T. Ahmed "Reservoir Engineering Handbook", 3rd Ed., Gulf Professional, 2006
M. Zoback, "Reservoir Geomechanics", Cambridge University Press, 2007.

Grade Policy: Grading is based on:

Homework:	20%
Midterm Exam:	25%
Final Exam:	35%
Term Project:	20%

Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
Score	95-100	90-94	85-89	80-84	75-79	70-74	65-69	60-64	55-59	50-54	45-49	<45

Homework Policy: Homework problems will be assigned every lecture and due at the beginning of the following lecture. Late homework will not be accepted, unless permitted by the instructor. Homework problems must be done individually. For the answers to homework problems, please follow these guidelines:

- 1) Present methods and equations used to solve the problem.
- 2) State the values used in each equation.
- 3) State any assumptions you make in your calculations with reasoning.
- 4) Show the units for each important variable.
- 5) For the assignments require programming, please submit a report describing your methods and results and the programming files. They should generate results without debugging.

Academic Honesty: All students are expected to adhere to the USC Student Conduct Code. *SCAMPUS*, the Student Guidebook, contains the Student Conduct Code. (*Appendix A*).
<http://www.usc.edu/dept/publications/SCAMPUS/gov/>

In case of suspicion of academic dishonesty, student(s) will be referred to the Office of Student Judicial Affairs and Community Standards for further review.

Students with Disabilities: Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. It is located in STU 301 and is open 8:30 a.m.5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.