



The University of Oklahoma  
School of Petroleum and Geological Engineering  
100 East Boyd Street, T301 Sarkeys Energy Center, Norman, Oklahoma 73019-0628  
(405) 325-2921, FAX (405) 325-7477

---

PE 4533-001 – APPLIED RESERVOIR ENGINEERING  
SPRING 2008

INSTRUCTOR:

FARUK CIVAN, Ph.D.  
Alumni Chair Professor  
PHONE: (405) 325-6778  
FAX: (405) 325-7477  
E-MAIL: fcivan@ou.edu  
Office Telephone: 325-6778  
Class Hours: F 1:30 – 4:20 p.m. SEC M-207  
Office Hours: WR 1:30– 2:45 p.m. SEC T203 (Call 325-6778 for appointment for other times)

---

TEACHING ASSISTANT: Mr. Tung Tran  
Office: SEC E-104  
Office Hours: T 2:00 - 3:00 p.m. and R 1:30 - 2:30 p.m.  
Office Telephone: 325-6920

---

IMPORTANT NOTICE:

IMPORTANT NOTICE:

- 1) PLEASE NOTE THAT ALL OF DR. FARUK CIVAN'S LECTURE NOTES, COURSE SYLLABUSES, HANDOUTS, HOMEWORKS, AND SEMESTER AND FINAL EXAMS ARE COPYRIGHT MATERIAL. THEY CANNOT BE REPRODUCED, RECORDED, AND COPIED IN ANY WAY OR FORM WITHOUT THE WRITTEN PERMISSION FROM DR. FARUK CIVAN. Copyright © 2003-2008 by Faruk Civan- All rights reserved.
- 2) USE OF PERSONAL COMPUTERS, ANY RECORDING DEVICES, CELL PHONES, AND ANY OTHER ELECTRONIC EQUIPMENT ARE NOT ALLOWED DURING CLASS.

DESCRIPTION:

This course has been designed to provide the knowledge of the advanced reservoir engineering concepts required for effective production of oil and gas.

TEXTBOOK:

Primary: Ahmed, T. and McKinney P.D.: Advanced Reservoir Engineering, Elsevier, 2005.  
Secondary: Mattax, C.C. and Dalton, R.L.: Reservoir Simulation – SPE Monograph Volume 13, SPE, Richardson, TX, 1991.

#### REFERENCES:

Dake, L.P.: Fundamentals of Reservoir Engineering, Elsevier, 1978.  
Craft, B.C., Hawkins, M. and Terry, R.E.: Applied Petroleum Reservoir Engineering, Prentice-Hall, Englewood Cliffs, NJ, 1991.  
Towler, B.F.: Fundamental Principles of Reservoir Engineering, SPE, Richardson, TX, 2002.  
Selected readings and handouts

Topics: Review of the fundamentals of reservoir engineering  
Applications of material balance concepts and water influx  
Modern well test analysis  
Multiphase flow concepts– relative permeability, capillary pressure, Leverett J-function  
Reservoir heterogeneity, characterization, and upscaling  
Introduction to reservoir simulation

#### PREREQUISITES:

PE 3513 – Fundamentals of Reservoir Engineering  
ENGR 3723 – Numerical Methods for Engineering Computation

#### EXAMS:

EXAM I February 22  
EXAM II March 28  
EXAM III April 25  
FINAL EXAM: May 2, F 1:30 – 3:30 p.m. SEC M-207 (Comprehensive)

No make-up examinations given except in very special cases to be evaluated by the instructor.

#### COURSE REQUIREMENTS:

##### Homework:

Several homework problems will be assigned and will be turned in to the instructor at the beginning of the class on the due date. The number of homework problems will vary depending on the lecture material.

You must submit all the assigned problems on time. Late homework will not be accepted (see the section on “attendance” for exceptions). For non-submitted problems their points will be automatically deducted. Unless the solution is tried no credits will be given for writing the problem statement.

Homework must be submitted on engineering papers or prepared by a word processor. Homework will be graded for correctness as well as the style standard and presentation. In general, you should write the problem statement, the questions for which answers are required, the data and references used, then present the solution. Underline the results clearly. Your handwriting should be readable.

Always review the example problems presented during the lectures and the solved problems in the book before attempting to do the homework problems. Work the homework problems on your own, as you will be doing so on examinations. (See the section on “Academic Dishonesty”).

## Exams:

Three semester exams as indicated on the schedule and a final exam which will be administered at the scheduled time. All of the exams will be open book and open notes exam. The coverage of the semester exams will be explained before the exam and examination time will be announced in advance. The final exam will cover the entire course.

## General Instructions for the Exams:

- Engineering paper will be used during the exams. 10 points will be deducted if engineering paper is not used. Make sure that your solution can be easily followed and your handwriting readable. Clearly indicate the basic principles, assumptions, considerations, etc., and data that lead to your solutions. Present all of the numbers with their units. Underline the results.
- Budget your time wisely. Do not spend excess time on any particular problem.
- Do not write on the backside of the paper, it will not be considered for grading.
- Anything on your paper will be considered for grading whether it is correct or incorrect. If you try several solutions, clearly cancel those that are incorrect or not to be graded. Otherwise, even if you give a correct solution along with incorrect solutions, points will be taken out for the incorrect solutions as much as 50 percent.
- Sign your name on the EXAM ATTENDANCE list that is circulated during the exam.
- Put your name on each page of your exam papers as well as on the top of the question sheet. When you finish the exam, fold the question sheet together with your exam papers. Write your name also on the other side of your folded papers and turn them in.
- Should you have any questions about the exam questions during the exam, raise your hand, but do not ask any questions about the exam questions.
- Make reasonable assumptions if you think there is any missing data or information.

Computer Usage: Encouraged for all assignments and required for some assignments (word processing, spreadsheets, etc.)  
Use of commercial software for material balance (OilWat/GasWat) and reservoir simulation (CMG suite).

Design Projects: Projects include an application of material balance concepts and a field development design using simulation.

Written and/or Oral Communications: Two written projects and one oral presentation

Teamwork: Two team-based projects

Attendance: Attendance is required and will be checked with your signature on the class attendance list. Excuses for absence can only be accepted if you notify the instructor within a period of time commensurable to the circumstances prior to the absence. Failure to take an examination or turn in homework when due will result in a zero score unless arrangements described herein are followed.

COURSE GRADE: Course grade will be determined by counting

Assignments	25%
Exams	45%
Final Exam	30%

#### FINAL GRADE DISTRIBUTION:

Final grade assignment will be A, B, C, D, F based on the curving method. But, the instructor reserves the right to deviate from this distribution at his discretion.

#### ACADEMIC DISHONESTY:

Neither plagiarism nor cheating will be tolerated and both will be dealt with following Mewbourne College of Earth and Energy policy. In general, academic dishonesty will subject a student to a penalty ranging from a zero on the particular assignment or examination to expulsion from the University for an indefinite period. Refer to OU Web page for details: [www.ou.edu/studentcode](http://www.ou.edu/studentcode)

#### ASSIGNMENT OF THE GRADE W:

This grade is reported for a student who withdraws from a course with a passing grade. This grade may also be reported as a final grade when the student has not been involved in a course long enough to be in the failing category. Failure in the course is not a reason for reporting a W. A student who withdraws from a course with failing grades shall receive a grade of F.

#### ACCOMMODATION FOR OU STUDENTS WITH DISABILITIES

Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact Dr. Civan personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate the student's educational opportunities.