PETE609/489 Course Syllabus – Summer 2016
M-W 01:00-05:00 pm- RICH 319

Instructor: Dr. Berna Hascakir, Texas A&M University - Petroleum Engineering Department
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Office Hours: Tuesdays any time from 8:30 till 17:30

Catalog Description: Fundamentals and theory of enhanced oil recovery; polymer flooding, surfactant flooding, miscible gas flooding and steam flooding; application of fractional flow theory; strategies and displacement performance calculations. Class will meet M-W 13:00-17:00 in RICH 319.

Teaching Assistance: Matthew Morte (matthewmorte@tamu.edu)
Office: RICH 602,
Office Hours : 10 :30 AM – 1 :30 PM on Fridays

Instructional Objectives

Topics Covered:

1. Introduction
2. Microscopic Displacement of Fluids in a Reservoir
3. Displacement in Linear Systems
4. Macroscopic Displacement of Fluids in a Reservoir
5. Mobility-Control Processes
6. Miscible Displacement Processes
7. Chemical Flooding
8. Thermal Recovery
9. Microbial EOR
10. Mining

Contributions to Meeting the Curriculum Requirements of Criterion:

Math and Science	None
Petroleum Engineering	This course provides students with a fundamental background on the determination and evaluation of EOR methods. It also provides mathematical tools for the analysis and interpretation of data.
General Education	None

Course Learning Outcomes and Relationship to Program Outcomes:

Course Learning Outcome: At the end of the course, students will be able to…	Program Outcomes
Describe the EOR methods used to recovery unconventional reservoirs or depleting conventional reservoirs Explain the physical meaning and **evaluate** the impact of fluid properties in reservoir engineering and production problems.	11
Compute the oil bank, water bank, injected fluid bank movements.	1
Calculate the oil recovery factor, water recovery factor.	5
Describe the laboratory procedures required for a successful EOR process.	1,3,5
Determine and analyze the differences in EOR methods.	5
Design an EOR technology to recover a specific reservoir.	2,3,5
Determine and propose the most effective and environmental friendly EOR technology.	2,3

Related Program Outcomes:

No.	PETE graduates must have…
1	An ability to apply knowledge of mathematics, science, and engineering.
2	An ability to design an EOR project by analyzing and interpreting data.
3	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
5	An ability to identify, formulate, and solve engineering problems.
11	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

COURSE SCHEDULE- RICH 313- M-W 13:00-17:00

Date	Day	Lecture Number	Topic	Assignment	Due Date
01-Jun-16	Wednesday	L1	Introduction- Microscopic Displacement		
06-Jun-16	Monday	L2	Displacement in Linear Systems	HW1	
08-Jun-16	Wednesday	L3	Macroscopic Displacement		
13-Jun-16	Monday	L4	Mobility Control	HW2	HW1
15-Jun-16	Wednesday	L5	Miscible Processes		
20-Jun-16	Monday	L6	Miscible Processes	HW3	HW2
22-Jun-16	Wednesday	L7	Thermal Processes		
27-Jun-16	Monday	L8	Microbial EOR	HW4	HW3
29-Jun-16	Wednesday	L9	Mining		
5-July-16	Tuesday	L10	Final Exam		HW4

* Scheduled program and the exam dates may change.

COURSE POLICIES

Prerequisites: PETE 310

Required Textbook: Don W. Green and G. Paul Willhite, Enhanced Oil Recovery, SPE Textbook Series Vol. 6., 1998, ISBN:978-1-55563-077-5; Larry W. Lake, Russel T. Johnson, William R. Rossen, and Gary A. Pope, Fundamentals of Enhanced Oil Recovery, Society of Petroleum Engineers, 2014, ISBN: 978-1-61399-328-6; PETE 609 class notes; Related technical papers

Attendance: Texas A&M views class attendance as an individual student responsibility (http://student-rules.tamu.edu/rule07). Attendance is essential to complete the course successfully. Material presented in lecture and class discussion may expand upon points only briefly considered in the required text.

Excused Absences: Rules concerning excused absences may be found at http://student-rules.tamu.edu/rule07. Except for absences due to religious obligations, **the student must notify her or his instructor in writing (acknowledged e-mail message is acceptable) prior to the date of absence if such notification is feasible**. **In cases where advance notification is not feasible (e.g. accident, or emergency) the student must provide notification by the end of the second working day after the absence.** This notification should include an explanation of why notice could not be sent prior to the class. If the absence is excused, the instructor must either provide the student with an opportunity to make up any quiz, exam or other graded activities or provide a satisfactory alternative to be completed within 30 calendar days from the last day of the absence.

Excused Absences for Religious Holy Days: Texas House Bill (effective 9/1/03) states "An institution of higher education shall excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable amount of time after the absence."

Makeup Policy: Makeup exams will be given without question for excused absences as defined by University Regulations. If you miss an exam for any other reason, you may request a makeup, but the makeup exam may have a different format from that given in class, must be completed within one week of the original exam date, and there will be a 5% penalty.

Exams: There will be one multiple choice exam during the final exam period. Exam will cover all material presented in the class. Final exam will be optional for undergraduate level students and mandatory for graduate level students. By the end of the semester every student will be informed on their average earned grade via e-campus. The undergraduate students can either accept their earned grade announced by

the end of the semester or they may take the final to improve their average grade. The average grade for the semester will be calculated based on their homework and class activities. If a student does not pay enough attention to class activities, their grades will be dropped 10%. If a student or students will do plagiarism, their works will be graded ZERO and they will be reported to the university according to the University Honor Code.

Extra Credits: There may be opportunities to earn extra credit during the semester. These activities will be announced in class. **There are no make-ups or substitutions for extra-credit opportunities**.

Assignments: Late assignments will normally be given a grade of zero. Every week, a homework assignment will be posted to e-campus. Students are responsible to answer all homework problems and submit their work to the TA. Assignments should be neat, easy to understand, and straight forward.

Student Conduct: **Academic Integrity Statement and Policy**, Aggie Code of Honor *"An Aggie does not lie, cheat, or steal or tolerate those who do."* Upon accepting admission to Texas A&M University, a student immediately accepts a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System. For more information: http://aggiehonor.tamu.edu/.
Each work that you turn in for this class MUST include your signature and the following statement. "On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

Classroom Behavior: Texas A&M University supports the principle of **freedom of expression for both instructors and students**. The university respects the rights of the instructors to teach and the students to learn. Maintenance of these rights requires classroom conditions that do not impede their exercise. Classroom behavior that seriously interferes with either (1) instructor's ability to conduct the class or (2) the ability of other students to profit from the instructional program will not be tolerated. An individual engaging in disruptive classroom behavior may be subject to disciplinary action. For additional information please visit http://student-rules.tamu.edu/rule21.

Grading Policy: Your grading will be calculated according to the table given below. Letter grades will be assigned to the following guideline: A=90-100 (Excellent), B= 80-89 (Good), C=70-79 (Satisfactory), D=60-69 (Passing), F=59 and below (Failing); I=Incomplete.

Assignment	Details	% of Grade
1. HW	HW1 (10%), HW2 (10%), HW3 (10%), HW4 (10%)	**40**
2. In Class Activity	The solution of in class activities will be given during the class, students responsibility is to attend all classes and follow all class activities, not all class activities will be asked to submit, submission will be requested randomly by class instructor.	**40**
3. Final Exam	Written Exam, multiple choice	**20**

Your grade in this class is earned, not awarded. I will NOT consider rounding up your overall grade. Throughout the semester, after each assignment or exam, you will be informed by your average grade.

ADA Policy Statement: (Texas A&M University Policy Statement) Americans with Disabilities Act (ADA) Policy Statement
The following ADA Policy Statement (part of the Policy on Individual Disabling Conditions) was submitted to the UCC by the Department of Student Life. The policy Statement was forwarded to the Faculty Senate for information.
The Americans with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu.

Coursework Copyright Statement: (Texas A&M University Policy Statement)
The handouts used in this course are copyrighted. By "handouts," this means all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, **you do not have the right to copy them**, unless you are expressly granted permission.
As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writing, etc., that belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated.
If you have any questions about plagiarism and/or copying, please consult the latest issue of the *Texas A&M University Student Rules*, under the section "Scholastic Dishonesty".
Prepared by: Berna Hascakir, May 19, 2016.