PETE 623 Course Syllabus-Spring 2016

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Catalog Description: Fundamentals and theory of water flooding; application of fractional flow theory; strategies and displacement performance calculations; wettability; relative permeability, and rock-water interaction. Class will meet T-Th 02:00-03:50 PM in RICH 208.

Instructional Objectives

Topics Covered:

1. Introduction
2. Natural Water Influx
3. Microscopic Efficiency of Immiscible Displacement
4. Macroscopic Displacement Efficiency of Linear Waterflood
5. Immiscible Displacement in Two Dimensions-Areal
6. Vertical Displacement in Linear and Areal Models
7. Waterflood Design
8. The Role of Reservoir Geology in the Design and Operation of Waterfloods

Contributions to Meeting the Curriculum Requirements of Criterion:

Math and Science	None
Petroleum Engineering	This course provides students with a fundamental background on waterflooding.
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 microscopic displacement processes occur during waterflooding.	11
Describe the relative permeability, wettability, capillary pressure, and interfacial tension concepts.	1,3,5
Determine and **Analyze** values of fractional flow.	5
Design a waterflood project.	2,3,5,11

Related Program Outcomes:

No.	PETE graduates must have…
1	An ability to apply knowledge of mathematics, science, and engineering.
2	An ability to design and conduct experiments, as well as to analyze and interpret 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 208

			Chapter: Reading	**Topics**	**HW**
			Introduction	Introduction-Natural Water Influx	
			Additional Notes	Natural Water Influx	HW1
			Chapter 2-pp-5-52	Microscopic Efficiency of Immiscible Displacement	
			Chapter 2-pp-5-52	Microscopic Efficiency of Immiscible Displacement	
			Chapter 2-pp-5-52	Microscopic Efficiency of Immiscible Displacement	HW2
			Chapter 2-pp-5-52	Microscopic Efficiency of Immiscible Displacement	
			Chapter 3-pp-53-110	Macroscopic Displacement Efficiency of a Linear Waterflood	
			Chapter 3-pp-53-110	Macroscopic Displacement Efficiency of a Linear Waterflood	HW3
			Chapter 3-pp-53-110	Macroscopic Displacement Efficiency of a Linear Waterflood	
			Chapter 3-pp-53-110	Macroscopic Displacement Efficiency of a Linear Waterflood	
			Chapter 4-pp-111-138	Immiscible Displacement in Two Dimensions-Areal	HW4
			Midterm	Presentation and/or Report Submission	
			Chapter 4-pp-111-138	Immiscible Displacement in Two Dimensions-Areal	
			Chapter 5-pp-139-188	Vertical Displacement in Linear and Areal Models	HW5
			Chapter 5-pp-139-188	Vertical Displacement in Linear and Areal Models	
			Chapter 5-pp-139-188	Vertical Displacement in Linear and Areal Models	
			Chapter 6-pp-189-224	Waterflood Design	HW6
			Chapter 6-pp-189-224	Waterflood Design	
			Chapter 7-pp-225-301	The Role of Reservoir Geology in the Design and Operation of Waterfloods	
			Review		
			Final Exam	03:30-05:30 PM RICH 208	

* Scheduled program and the exam dates may change.

COURSE POLICIES

Prerequisites: PETE 311; PETE 310; CHEM 107; CVEN 305; MEEN 315; MATH 308

Required Textbook: - PETE 623 class notes, G. Paul Willhite, Waterflooding, SPE Textbook Series Vol. 3, 1986, ISBN:978-1-55563-005-8, and 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. Moreover, there will be pop quizzes presented as class activities during class hours, therefore, students are expected to attend class, to bring textbook, notes, homework problems and calculator all time. Attendance for Distance Learning (DL) students will be monitored through video watching records.

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. For pop quizzes (class activities) there will be no make-up, if you have an excuse, the average of the pop quizzes will be taken by excluding the pop quizzes you miss.

Exams: There will be two exams during the semester, one during class and one during the final exam period. Each exam will cover approximately three to four weeks of material presented in the class.

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. There will be homework assignments for each week or once in two weeks. Students are responsible to answer all homework problems.

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	There will be 6 homework assignment each will have 4% contribution to overall grade	24
2. Pop Quizzes/class activities	These assignments are random	16
3. Midterm	Presentation and/or report submission	30
8. Final Exam Comprehensive	Written or a project (depends on the performance of the midterm exam)	30

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

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://www.tamu.edu/aggiehonor. 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.

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, June, 02, 2015