PNGE 633 - Advanced Secondary Recovery

Semester: Fall 2016
Class schedule: One sessions per week, 150 minutes per session
Instructor: Dr. Ali Takbiri, 333D Mineral Resources Building, Ph: 304-293-3973
altakbiri@mail.wvu.edu
Website: http://ali-takbiri.pnge.statler.wvu.edu/pnge633.shtml
Location: MRB-E 105
Office Hours: Wednesday 2:00-4:00 p.m. or by appointment

References:

3. Course slides and notes
4. Selected papers from SPEJ, JPT, JCPT, etc

Simulation software:

There will be class homework and a final project that requires the use of a reservoir simulator (CMG). Training sessions and tutorial material will be offered.

Computer Programming:

Some of the homework and assignments will involve computer programming using MATLAB and/or Python.

Course Learning Outcomes:

This course will provide a scientific and technological foundation designed to provide answers to questions important to those interested in investigating the potential of secondary recovery techniques in enhanced energy production.

This course provides an overview of secondary and enhanced oil recovery methods (EOR) including waterflooding, thermal, miscible gas, and chemical flood methods. Emphasis is on process mechanisms and reservoir engineering aspects of these methods.

In this course, fundamentals and theory of EOR techniques (polymer flooding, surfactant flooding, miscible gas flooding and steam flooding) and application of fractional flow theory and strategies and displacement performance calculations will be presented. Furthermore, it will provide the students with the methodology and the tools to evaluate and quantify the potential, uncertainties and risks involved in secondary oil recovery and EOR. Safety, economic, and environmental aspects will also be covered.

Topics covered:

- Introduction to immiscible displacement fundamentals, waterflooding, and EOR
- Waterflooding
Steam injection methods fundamentals
Miscible gas fundamentals
Hydrocarbon miscible and CO₂ flooding
Polymer waterflooding and surfactant flood

Grading Policy:

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Term Paper</td>
<td>15%</td>
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<tr>
<td>Final Exam</td>
<td>25%</td>
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<tr>
<td>Quizzes and Homework</td>
<td>35%</td>
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<tr>
<td>Final Project</td>
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Grade Assignment:

- 100 - 90  A
- 89 - 80   B
- 79 - 70   C
- 69 - 60   D
- 59 - 0    F

Attendance Policy:

Attendance is important. Consistent with WVU guidelines, students absent from regularly scheduled classes because of authorized University activities will have the opportunity to take them at an alternate time. Make-up exams for absences due to any other reason will be at the discretion of the instructor.

Social Justice Statement:

“West Virginia University is committed to social justice. I concur with that commitment and expect to maintain a positive learning environment based upon open communication, mutual respect, and nondiscrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class. Please advise me and make appropriate arrangement with Disability Services (293-6700).”

Academic Integrity:

The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the Student Conduct Code http://studentlife.wvu.edu/office_of_student_conduct/student_conduct_code. Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see me before the assignment is due to discuss the matter.