PNGE 480
Petroleum Engineering Design

Instructor: Dr. Ali Takbiri-Borujeni

Location: ESB-E 401

Semester: Spring 2017

Office Hours: Open door or by appointment (altakbiri@mail.wvu.edu)

Class Schedule: TR 02:00 pm-03:15 pm

Course Objectives: Introduce students with comprehensive design problems in petroleum engineering involving well log interpretation, production well design, and systems in oil and gas production.

Prerequisite: PNGE 420, PNGE 434, and PNGE 441

Grading Policy: Class Participation, Quizzes, and Homework: 10%
Preliminary project content and presentations: 20%
Final Project Report: 50%
Final Project Presentation: 20%
Homework and projects are due at the time specified.
Late homework or projects: 5% penalty for every class meeting.
Attendance: Required

Grades: 90 and above A
80-89 B
70-79 C
60-69 D
59 and below F

Textbook: None Required. All material will be provided throughout the semester.
Course Learning Outcomes:

- The main objective for the course is for the students to apply all the petroleum engineering knowledge they acquired during their past four years to real petroleum engineering problems.
- Students will generate structural and isopack maps from the data gathered from the logs and coordinates of the wells.
- Students will distribute the thickness, depth, water saturation, porosity, and permeability in the field using geostatistical techniques using commercial software.
- Students will apply their production well design knowledge to design the best casings and tubings.
- Using the production data from the production wells, students will perform decline curve analysis of the field.
- To build the reservoir model, students generate grids using the generated maps. Furthermore, they generate phase diagram of the fluids present in the reservoir.
- Students will perform different recovery scenarios (primary recovery, CO2 EOR and waterflooding) on the reservoir model. Furthermore, they perform comprehensive economic analyses of the simulation models.

Topics covered:

1. Overview of petroleum engineering: drilling, production, and reservoir engineering
2. Introduction to petroleum engineering databases
3. Well log interpretation: hands on experience with the data from real oil fields
4. Generating structural and Isopack maps from the interpreted well logs
5. Geostatistics using the data from the interpreted well logs
6. Production well design: casing and tubing design
7. Decline curve analysis using the production data from the oil field
8. Building the reservoir model
9. Simulating CO2 EOR and waterflooding simulations on the field under study

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).”
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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 at [http://studentlife.wvu.edu/studentconductcode.html](http://studentlife.wvu.edu/studentconductcode.html). 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.

**Emergencies:**
In the case of an emergency such as fire alarm, please evacuate the building and gather at least 100 feet away from the building. DO NOT return to the building until the emergency is over and it is cleared by the fire marshal or police.