Course Description and Syllabus
PNGE 711 Advanced Production Engineering

Course Format: Lecture

Textbooks: Production Optimization Using NODAL Analysis

Course Pre-requisite: PNGE420

Course Objectives:

This course will provide the students with knowledge of advanced topics in production engineering. The emphasis will be given to areas of new advances in well completion, problem well analysis, workover planning, multiphase flow in pipeline, and application of NODAL analysis to surface and subsurface production equipment.

Expected Learning Outcomes:

The students will be able to:

1. Apply advanced techniques for well completion.
2. Plan well remediation and workover for problem wells.
3. Design oil and gas production systems using NODAL analysis.
4. Select and size surface and subsurface production equipment.

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Outline:

Week Topic

1. Problem Well Analysis
2. Remedial and Squeeze Cementing (Homework No. 1 due, Project 1 is assigned)
3. Sand Control (Homework No. 2 due)
4. Wokover Systems Planning (Homework No. 3 due)
5. Perforating Tools and Method (Homework No. 4 due)
6. Horizontal Well Completion (Homework No. 5 and Project 1 are due)
7. Multiphase Flow Considerations (Homework No. 6 due, Mid-term Exam)
8. Artificial Lift Methods-Sucker Rod Pumping (Homework No. 7 due)
9. Artificial Lift Methods-Gas Lift (Homework No. 8 due, Project 2 is assigned)
10. Surface and Subsurface Pumping Equipment (Homework No. 9 due)
11. System Analysis Approach for Well Performance (Homework No. 10 due)
12. Application of NODAL Analysis (Homework No. 11 due)
13. Gas-Liquid Separators (Homework No. 12 due)
14. Oil-water Separators (Homework No. 13 and Project 2 are due)
15. Oil-Water Treating Equipment (Homework No. 14 due)

**Grading:**

1. Attendance (Attendance is required. Each absence results in 1% deduction)
2. Homework (Approximately one per week- total of 14)
3. Projects (2 major design projects- 4 weeks to complete each project)
4. Mid-term Exam (in-class exam, open book, 1.5 hrs)
5. Final Exam (comprehensive exam open book, 2 hrs)

**Make-up exam policy:** Make-up exam will be given only when there is an excused absence.

**Attendance Policy:** Attendance is compulsory - the policy will be provided during the first class meeting.

**Social Justice Statement:**

“The West Virginia University is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion. 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 arrangements with the Office of Accessibility Services (304-293-6700). For more information on West Virginia University’s Diversity, Equity, and Inclusion initiatives, please see http://diversity.wvu.edu.”

**Academic Integrity Statement:**

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. 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.

INSTITUTIONAL POLICIES: Students are responsible for reviewing Policies on: INCLUSIVITY, ACADEMIC INTEGRITY, INCOMPLETES, SALE OF COURSE MATERIALS, SEXUAL MISCONDUCT, ADVERSE WEATHER, STUDENT EVALUATION OF INSTRUCTION, AND DAYS OF SPECIAL CONCERN/RELIGIOUS HOLIDAY STATEMENTS.