

For grad students only

Course Description and Syllabus PNGE 711 Advanced Production Engineering

Course Format: Lecture

Textbooks: **Production Optimization Using NODAL Analysis**

Course Pre-requisite: PNGE 420

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.