

Course Description and Syllabus

PNGE 770 Advanced Natural Gas Engineering

Catalog Description:

PNGE 770. Adv Natural Gas Engineering. 3 Hours.

PR: PNGE 470. Application of reservoir modeling, history matching, and type curves techniques to analyze and predict the performance of conventional and unconventional gas reservoirs.

Course Format: Lecture

Textbooks: No textbook is required. Notes will be made available by the instructor. Course will require extensive use of internet-based resources.

Course Prerequisite: Graduate or Senior level standing (with Chairman's approval)

Course Objective:

This course will provide the student with knowledge of advanced, current and practical topics in Natural Gas Engineering. The topics will focus on operations and challenges related to the production of gas from the wellhead to market. An over-riding objective is to provide the student with exposure to practical concepts, to apply basic analytical and engineering techniques and methods and to provide an experience to address issues in a business-like setting.

Expected Learning Outcomes:

The student will be able to:

1. Fully explain the process and parties involved to move gas from the wellhead to market.
2. Identify critical regulatory and commercial requirements for marketable gas
3. Determine appropriate requirements and associated processing options to make gas marketable
4. Identify causes, monitoring techniques and mitigation approaches for corrosion.
5. Understand and apply risk management principles as related to production, storage and transmission operations
6. Develop and apply basic process logic for control/automation operations
7. Identify regulatory requirements, environmental and social concerns, logistical considerations and basic construction techniques and practices for well site development
8. Apply various decision making methods, including multi-objective analysis to natural gas development projects.
9. Develop and apply basic project management techniques and processes.

Semester: Spring 2015

Location/Time: Room 209, Engineering Science Building

Instructor: Reed Robinson
(304) 549-1574
reed.d.robinson@gmail.com
rarobinson@mail.wvu.edu

Office Hours:

- In person – immediately after class
- Via email – will check at least every other day
- Other – arrange by appointment

Outline (tentative – may change based on student background and ability):

<u>Week</u>	<u>Topic</u>
1	Fundamentals
2	Industry Overview (Wellhead-to-Burner Tip)
3	Gas Quality
4	Processing
5	Well Site Logistics
6	Natural Gas Storage
7	Corrosion
8	Integrity Management
9	Automation and Control
10	U.S. Regulatory Environment
11	Well/Pipeline Siting
12	Well Site Construction
13	Project Management
14	Environmental/Water Management
15	Buying, Selling and Marketing

Grading:

1. Attendance. Because this is a once-a-week class, attendance is mandatory. Each unexcused absence results in a 1% deduction
2. Homework (35%). Homework will typically be assigned every other week (expect a total of 8 – 10 assignments).
3. Projects (35%). 3 – 4 projects will be assigned. Typically a project will be assigned one week, an opportunity to discuss and ask questions the following week and due the 2nd week after assignment.
4. Mid-term Exam (15%). In-class. Open book/note. 1 – 1 ½ hours
5. Final Exam (15%). Open book/note. 1 – 1 ½ hours

Grading Scale:

A:	91 – 100%
B:	80 – 90%
C:	70 – 79%
D:	55 – 69%

Make-up exam policy: Make-up exam will only be given with a valid, excused absence. The student is responsible to notify, justify and schedule.

Attendance Policy: Mandatory.

Days of Special Concern:

- WVU recognizes the diversity of its students and the needs of those who wish to be absent from class to participate in Days of Special Concern, which are listed in the schedule of courses.
- Students should notify their instructors by the end of the second week of classes regarding Day of Special Concern observances that will affect their attendance.
- Reasonable accommodation will be made for missed quizzes or exams as a result of observing a Day of Special Concern.

Classroom Conduct

- You are expected to conduct yourself in a professional manner while in class.
- Be on time. Do not enter the classroom after the class has started. Return from breaks on time.
- Attend to any personal needs (drink, phone calls, texts, restroom, etc.) prior to class or during a break.
- While in class, everyone is expected to remove their hats, sunglasses, ear buds, etc.
- Cell phones should be turned off.
- Unprofessional, rude, disruptive or inattentive behavior will be considered an unexcused absence (for grading purposes).

Assignment Submission: Unless otherwise stated and/or arranged, all homework and projects are to be submitted at the beginning of class on the due date. In the case of an excused absence, arrangement shall be made to submit prior to the due date.

West Virginia 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 non-discrimination.](#)

Our university does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestion as to how to further such a positive 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 \(293-6700\)](#)**.*

WVU 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.