



PETE 426—Drilling Engineering

Course Information

Title:	Drilling Engineering
Course Number:	PETE 426
Semester:	Spring 2014
Credits:	3
Prerequisite:	ES F331 (Mechanics of materials) ES F341 (Fluid Mechanics) or approval of instructor
Class Meetings (Fairbanks):	Murie 107, T, Th, 7-8:30pm
Class Meetings (Anchorage):	GHH Room 101E, T, Th, 7-8:30pm

Instructor Information

Instructor Name:	Dare Awoleke
Office location:	DUCK 407
Office hours:	3-4PM, Mondays and Fridays
Telephone:	(907) 474-7574
Email:	ooawoleke@alaska.edu

Course Readings/Materials

Note: The student is strongly encouraged to have access to the following book. Handouts and slides (if necessary) will be provided. **Students should expect to utilize OnePetro to access technical papers.**

- Applied Drilling Engineering by Bourgoyne, Chenevert, Millheim and Young (SPE Textbook Series, Vol. 2)
- Oil well drilling primer, 7th edition by the University of Texas Petroleum Extension Service

Course Description

Principles of drilling, drilling fluids and rheology, drilling problems, drilling hydraulics, well control techniques and casing seat selection.

Course Goals

The goals of this course are the following:

1. Design and evaluate well drilling systems; identify and solve drilling problems for all well geometries.
2. Calculate the pressure requirement at every stage of the drilling operation from the pump to the bit and back to the surface based on rheological models and drilling hydraulics procedures and the API recommended practices.
3. Design casing, taking into consideration the pore pressure and the fracture gradient of the formation.
4. Establish a proper procedure for well control to ensure the safety of the personnel and to protect the environment.
5. Design a proper cementing procedure for cementing the casing or abandoning a well, taking into considerations the environmental and legal issues.

Instructional Methods

Three-hour lecture per week



Topics covered (tentative list)

1. The drilling rig, terminology, drilling fluids; drilling problems and solutions
2. Wellbore hydraulics and design of circulation system
3. Casing design procedures; collapse, burst, tension
4. Abnormal pressures prediction, well control
5. Fracture gradient prediction
6. Design of primary and secondary cementing jobs
7. Liner cementing, setting of cement plugs*
8. Directional drilling, wellbore surveying techniques*
9. Horizontal drilling, coiled tubing drilling*

*dependent on class progress

Grade Policy and Distribution

Midterm (Sometime before spring break)	30%
Homework	30%
Final Exam	30%
Class participation	10%

Letter grade cut-offs

A+ (100%); A (99.99-95%); A- (94.99-90%); B+ (89.99-85%); B (84.99-80%); B- (79.99-75%); C+ (74.99-70%); C (69.99-65%); C- (64.99-60%)

Attendance

Attendance in class is your responsibility. Having said this, class attendance is important. I will be supplementing the material in the recommended textbooks with additional published and unpublished material. Therefore, I encourage you to attend class regularly. Note that students are responsible for making up any missed work (lectures and homework). Students are encouraged to arrive to class on time because late-coming disrupts the flow of the class for both the instructor and the other students.

Laptops and phones

All laptops and phones must be powered off during class. No texting is allowed. If you need your laptop for a particular exercise, you will be informed by the instructor.

Homework Policy

Homework is due at the end of class on the designated date. Hand-written homework submissions are not acceptable. Late homework will be docked at the rate of 10 points per day after due date. You can discuss the homework problems with your peers but you must work out the problem **independently** and turn in a **personal** solution. **A duplicate of someone else's solution/work is cheating.** If you want your work re-graded, inform the instructor within **a week** of when the work was returned to you.

Make-up Exam Policy

There will be no early, late or make-up exams unless the student obtains prior approval of the instructor. Approval for make-up exams will only be granted for family and medical emergencies. In case a student misses a test or exam, the student needs to provide legitimate documentation related to the incident no later than the next class after the test. If the absence is determined to be a non-excused absence, the student will receive a score of zero for the exam that was missed.



Academic Dishonesty

We follow the university guidelines for plagiarism/academic integrity as outlined in the link given below: <http://www.alaska.edu/bor/policy/09-02.pdf>. The student is encouraged to read this document and note the definition of all the different types of academic dishonesty. Also note that as a UAF student, you are subject to UAF's Honor Code:

"Students will not collaborate on any quizzes, in-class exams, or take-home exams that will contribute to their grade in a course, unless permission is granted by the instructor of the course. Only those materials permitted by the instructor may be used to assist in quizzes and examinations.

Students will not represent the work of others as their own. A student will attribute the source of information not original with himself or herself (direct quotes or paraphrases) in compositions, theses and other reports.

No work submitted for one course may be submitted for credit in another course without the explicit approval of both instructors.

Violations of the Honor Code will result in a failing grade for the assignment and, ordinarily, for the course in which the violation occurred. Moreover, violation of the Honor Code may result in suspension or expulsion."

Disability Services

The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. We will work with the Office of Disabilities Services (203 WHIT, 474-7043) to provide reasonable accommodation to students with disabilities in accordance with the following link: <http://www.alaska.edu/bor/policy/09-06.pdf>

Note:

Spring Break: March 17th to 21st

Absences we will need make-up classes for or I will give you homework due at the end of each successive class period:

Week of February 3rd