
The University of Tulsa
Petroleum Engineering Department
Course Syllabus for Spring 2008
PE 7063
Advanced Drilling

Prerequisites: As specified by the Graduate Bulletin

PE 3043 or permission of instructor

Good background in mechanics of fluids and solids

Instructor: Dr. Ramadan Ahmed

Class Hours: 02:00pm - 03:15pm, T & TH, KEP, Room M3

Office Hours: 3:15 pm to 4:30 pm Th and Th (KEP L119)

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Main Topics Covered

1. Review of Fluid Mechanics Fundamentals: Newtonian fluid flow in pipes and annulus, rheological models, viscometer flows;
2. Power Law (PL) and Yield Power Law (YPL) flow in pipes and annuli, foam flow;
3. Hydraulic program design, drilling model, optimum WOB and RPM;
4. Cuttings and solids transport;
5. 2D and 3D well plans and trajectory predictions;
6. Drag and torque models.

Recommended references:

Technical papers:

As discussed in class

Books and Teaching Notes:

1. A. Lubinski: "Developments in Petroleum Engineering" Vol. 1 and Vol. 2. Edited by S. Miska, Gulf. Publishing Co ISBN 0-87201-038-4 and 0-827201-177-1.
2. Miska, S.Z. "Advanced Drilling", Teaching Note, University of Tulsa, 2004.
3. A.T. Bourgoyne Jr. et al. "Applied Drilling Engineering"

Possible topics for course projects:

Non-Newtonian fluid flows (rotation flow, pipe eccentricity, helical flow etc);
Wellbore thermal models;
Foam flow modeling;
3D well plan;
Wellbore stability;
Cuttings transport - conventional fluids;
Drilling sweeps;
Coiled tubing drilling (CTD);
Downhole motors;
Drag and torque analysis;
Tripping operations and well control;
Drill string vibrations;
Others.

Evaluation and grading

Home assignments:	20%
Midterm exam;	25%
Project;	25%
Final	30%

Your grading is determined solely by your performance on the home assignments, projects and exams. Active participation in the class is strongly encouraged.

The work done must be your own

A violation of the rules of academic conduct may result in an "F" in the course.