Course title and number: PETE 689: High Performance Drilling  
Term (e.g., Fall 200X): Fall 2014  
Meeting times and location: Rich 302 MWF 1:50-2:40 pm

Course Description and Prerequisites

The purpose of this course is to prepare the student to able to achieve differentiating drilling performance in the most complex wells. The physics-based practices taught represent the state of the art in high-performance drilling. This includes the underlying physics of each type of performance limiter, real time operational practices, engineering redesign practices, and effective workflows for achieving the required change in engineering and operational practices.

Prerequisites

Graduate classification or instructor approval  
PETE 661 or 405

Course Topics, Calendar of Activities, Major Assignment Dates

The major subject areas are listed below. Homework will be submitted on Mondays and returned on Tuesdays (10 assignments). Three exams will be given, which are not comprehensive and cover the lecture material in equal parts. A relatively brief group project will be due two weeks prior to the end of semester which allows the student to practice the steps required to implement change in how an organization works.

- Introduction and syllabus. Drilling business models
- Performance management workflows and performance limiters
- Bit mechanics and Mechanical Specific Energy surveillance
- Diverse applications of Mohr-Coulomb strength concepts in drilling
- Engineering and operational practices to address bit performance limiters
  - Bit balling
  - Vibrations
  - Bottom hole balling
  - Interfacial severity
- A process for creating change in work practices (LRD™)
- Borehole stability design and real time operational practices
  - Managing hoop stress while drilling
  - Achieving stability in fractured shales and coals
  - Achieving stability in unconsolidated sands
- Elimination of differential sticking
- Hole cleaning practices to maximize footage per day
- Practices to eliminate reaming and circulation time
• Formation integrity testing  
• Practices to eliminate lost circulation time and cost

Instructor Information

Name: Fred Dupriest, Professor of Engineering Practices  
Telephone number: 979-862-1138 (W), 713-548-7927 (C)  
Email address: fred.dupriest@pe.tamu.edu  
Office hours: TBD  
Office location: 501L Richardson Building

Fred Dupriest retired in 2012 as the Chief Drilling Engineer for ExxonMobil. He has published 20 papers on new operational practices to enhance drilling performance. These include design and operational practices to use mechanical specific energy (MSE) surveillance to maximize bit performance, eliminate differential sticking, improve borehole stability management, reduce vibrations, eliminate differential sticking, and enhance lost circulation and well control management. He was also instrumental in developing Fast Drill™ and Limiter Redesign™ performance management workflows. He is an inductee in the AADE Drilling Fluids Hall of Fame and received the 2012 SPE Drilling Engineering Award.

Textbook and/or Resource Material

The main source of material for the course will be presentation slides and other reference material posted on a shared class site.

Grading Policies

Homework……………………………………………………………………………………………………. 20%  
Group Project…………………………………………………………………………………………………. 10%  
3 Non-comprehensive Exams……………………………………………………………………………… 70%  
Total…………………………………………………………………………………………………………… 100%  

Grading Scale

A……………………………………………………………………………………………………………90-100%  
B……………………………………………………………………………………………………………80-89%  
C……………………………………………………………………………………………………………70-79%  
D……………………………………………………………………………………………………………60-69%  
F………………………………………………………………………………………………………………0-59%

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu

Academic Integrity

For additional information please visit: http://www.tamu.edu/aggiehonor

“An Aggie does not lie, cheat, or steal, or tolerate those who do.”