

PETR 5331— DRILLING SIMULATIONI

Catalog Data:	5331. Drilling Simulation (3). Well Control Techniques and methods which are used to control kicks during operations. (Design Course) (Writing Intensive).
Prerequisites:	PETR 5303, 4307, 3401 with a C or better; 3.0 GPA; Petroleum Major
Co requisites:	PETR 5121
Textbook:	<i>Assigned reading, technical papers, and notes distributed in class.</i> <i>Advanced Drilling & Well Technology</i> , Bernt Aadnoy, Iain Cooper, Stefan Miska, Rogert F. Mitchell, & Michael L. Payne; SPE 2009, 1 st edition 888 pages, softcover, ISBN: 9781555631451.
Reference:	<i>Fundamentals of Drilling Engineering</i> , Robert F. Mitchell & Stefan Z. Miska, Vol. 12, SPE, 2011, ISBN: 97855563-338-7 <i>Applied Drilling Engineering</i> , A.T. Bourgoyne Jr., K.K. Millheim, M.E. Chenevert, & F.S. Young Jr., Vol. 2, SPE, 1986, Chapter 1-4 pg. 1-189 <i>Fundamentals of Rotary Drilling</i> , W. W. Moore, Energy Publications, 1981. <i>Petroleum Engineering Drilling & Well Completions</i> , C. Gatlin, Prentice-Hall, Inc., 1960.

Disclaimer: "Topics and/or dates may be changed during the semester at the instructor's discretion because of scheduling issues, developments in the discipline, or other contingencies. Evening Exams may be scheduled"

Topics	Time*	Outcomes (Goals)	Assessment Method
Introduction to the 3D drilling simulator	1 week	Watch training videos and understand how the simulator works.	Homework, Quizzes, Exams on Computer simulator
Positive Kick Indicators	1 week	Understand positive kick indicators and detect them.	Homework, Quizzes, Exams on Computer simulator
Kick During Connections	1 week	Detect and handle kick during connections.	Homework, Quizzes, Exams on Computer simulator
Loss Circulation & Ballooning	1 week	Understand loss circulation and ballooning. Detect ballooning and discern it from kick.	Homework, Quizzes, Exams on Computer simulator
Kick During Tripping	1 week	Detect and handle kick during tripping in and out.	Homework, Quizzes, Exams on Computer simulator
Kick During Running Casing	1 week	Detect and handle kick during casing running operation.	Homework, Quizzes, Exams on Computer simulator
Possible Kick Indicators	1 week	Understand positive kick indicators and detect them.	Homework, Quizzes, Exams on Computer simulator
Drilling with Random Kick Indicators	1 week	Detect and handle kick during drilling operation.	Homework, Quizzes, Exams on Computer simulator
Driller's Method	2 weeks	Understand how to kill a well using driller's method. Perform necessary calculations (kill mud weight, formation pressure, MAASP, etc.) Understand and calculate kill sheet.	Homework, Quizzes, Exams on Computer simulator
Wait & Weight Method	2 weeks	Understand how to kill a well using Wait & Weight method. Perform necessary calculations (kill mud weight, formation pressure, MAASP, etc.) Understand and calculate kill sheet.	Homework, Quizzes, Exams on Computer simulator
Make up Week	1 week		Homework, Quizzes, Exams on Computer simulator
Exams	1week	Per final exam schedule TFRPETR 208	Final & graduate credit 30 page report & defense

*Dates are subject to change

Graduate students will write a 30 page report on a recent well control incident, determining the causes, effects, warning indications and recommend preventive solutions. They will present their findings to the entire class during finals.

Coordinator:	Lloyd R. Heinze, P.E. Ph.D. Professor, Bob L. Herd department of Petroleum Engineering TFRPETR 228, Lloyd.Heinze@ttu.edu
Attendance & Grading Policy:	Attendance is mandatory for all lectures and exam sessions. Any missed quizzes/homework will not be made up. Homework is due during the first 5 minutes of class via blackboard; late homework will not be accepted.

	<p>Reports (50%) Students must submit report individually for each scenario using simulator. Although due dates for reports are typically announced in class it is the students' responsibility to keep up with the due dates. Late report will not be accepted. A missed report will be given a grade of zero. All submitted report must include a cover sheet with your name on it. Report should be submitted in a pdf file. Cheating in writing reports will results in zero score in the report. Two offenses will results in F in the class. Expect about 10 different well control scenarios during the semester. Reports will be assigned and submitted only via BLACKBOARD.</p> <p>Report presentations shall include:</p> <p>The original problem statement, given information, what is required, and a logical procedure leading to a solution. Neatly drawn sketch with pertinent details such as dimensions, labels, and units, when appropriate. Box, circle or highlight the answer or principle conclusion.</p> <p>Final (25%) The final will be running multiple scenarios using simulator</p> <p>Homework/Quiz Presentations Average (25%) in the lecture part of class.</p> <p>Missing/Incorrect Grades It is the student's responsibility to notify the instructor if there is a missing or incorrect grade recorded on the Blackboard grade book as soon as possible, i.e. not on the last day of class.</p> <p>Grading Policy</p> <table> <tr> <td>90-100%</td><td>A</td></tr> <tr> <td>80-89%</td><td>B</td></tr> <tr> <td>70-79%</td><td>C</td></tr> <tr> <td>60-69%</td><td>D</td></tr> <tr> <td>0-59%</td><td>F</td></tr> </table> <p>Instructor reserves the right to adjust the grade distributions for the entire class; i.e. grade distributions will not be adjusted for individuals.</p>	90-100%	A	80-89%	B	70-79%	C	60-69%	D	0-59%	F
90-100%	A										
80-89%	B										
70-79%	C										
60-69%	D										
0-59%	F										
Class Time & Location:	<p>Lecture Time: Tuesday & Thursday 12:30-13:50 in TPER 110</p> <p>Discussion Time: Drilling Simulator lab TFRPETR 203 as scheduled</p>										
Course Web Site:	The University "blackboard" web site schedule of reading and homework assignments.										
<p>Notes:</p> <p>ADA Compliance:</p> <p>Calculators:</p> <p>Academic Integrity:</p> <p>Policy Classroom Citizenship:</p>	<p>Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.</p> <p>Only approved NCEES calculators can be used during exams, tests and quizzes. A current list can be found at http://www.ncees.org/exams/calculators/#policy</p> <p>Academic Integrity is described in the Bulletin of Texas Tech University Undergraduate and Graduate Catalogue and OP 34.12. The penalty for Academic dishonesty will be a grade of "F" for the course.</p> <p>All students are expected to come to class alert and ready to participate. If you must leave the class before the end of the session, do not return. Sleeping, reading newspapers, surfing the net and doing homework for other classes are not allowed during class. Students are expected to assist in maintaining a classroom environment that is conducive to learning. PDA's, cell phones, beepers and other electronic devices are distracting and should be silenced during class time. No Tobacco products are allowed. When exiting the classroom place your trash in the waste can, the next student will appreciate your diligence.</p>										
Prepared by / Date:	Lloyd R. Heinze / 26 August 2016										