

PET 409E WELL DESIGN AND COMPLETIONS

Course Title		Well Design and Completions				
			Course Implementation, Hours/Week			
Code	Semester	Local Credits	ECTS Credits	Theoretical	Tutorial	Laboratory
PET 409E	7	3	6	3	0	0
Department		Petroleum and Natural Gas Engineering				
Course Type		Elective		Course Language		English
Course Prerequisites		STA 204E MIN DD and AKM 204E MIN DD				
Course Category By Content, %		Math & Basic Sciences		Engineering Topics; Check if Contains Significant Design (√)		Other
		-		100		-

Course Description	Casing design and cementing. Casing/tubing landing. Wellhead assembly. Modes of completion in vertical, directional, and multi-lateral wells. Well completion fluids and equipment. Formation damage mechanisms and control. Perforation. Sand control. Well corrosion and prevention. Plugging and abandoning a well.		
Course Objectives	<ol style="list-style-type: none"> 1. Introducing the well construction modes, techniques, and equipment to convert a borehole into a wellbore. 2. Introducing the techniques for putting wells on sustainable production. 3. Introducing the major wellbore problems and workover techniques. 4. Introducing the basic techniques for well plugging and abandonment. 		
Course Learning Outcomes	<p>Students who pass the course will be able to:</p> <ol style="list-style-type: none"> 1. Apply knowledge of mathematics, science, and engineering for designing, landing, and cementing of casing and tubing strings. 2. Analyze and interpret data upon identifying, formulating, and solving problems for selecting proper equipment and materials to put wells on production. 3. Understand the impact of engineering solutions for wellbore problems and well abandonment in environmental and economic context. 4. Explore the contemporary techniques and/or engineering tools necessary for well design and completion practices. 		
Textbook	<ol style="list-style-type: none"> 1. Bellarby, J., (2009), <i>Well Completion Design</i>, Developments in Petroleum Science, Vol .56, Elsevier, Amsterdam, The Netherlands. 		
Other References			
Homework & Projects	-		
Laboratory work	-		
Computer Use	Students will be using the computer for their homework assignments.		
Other Activities	-		
Assessment Criteria	Activities	Quantity	Effects on Grading, %
	Midterm	1	25
	Quiz	3-5	15
	Homework	6-8	20
	Project	-	-
	Term Paper/Project	-	-
	Laboratory Work	-	-
	Other Activities	-	-
	Final Exam	1	40

Weeks	Course Plan	Course Outcomes
1	Essentials of well design and completions.	1
2	Casing run and cementing.	2
3	Casing design. Surface and intermediate casing strings.	2
4	Casing design. Production casing and tubing strings.	2
5	Casing/tubing landing.	2
6	Wellhead assembly.	3
7	Modes of completion in vertical, directional, and multi-lateral wells.	3
8	Completion fluids.	1-3
9	Formation damage mechanisms and controlling major wellbore problems.	3
10	Perforation. Putting wells on production.	3
11	Well completion and workover equipment.	1-4
12	Sand control.	1-4
13	Corrosion and prevention in wells.	3
14	Well plugging and abandonment.	4

Related Performance Indicators
1b. Apply engineering methods to reservoir, drilling and production engineering problems 4b. Recognize the economic, environmental, or global effect of petroleum, natural gas, and geothermal engineering practices 6b. Acquire, analyze, and interpret data. 7a. Acquire new information relevant to tasks without guidance

Relationship of Course Learning Outcomes to the Performance Indicators				
Course Learning Outcome	Performance Indicator			
	(1b)	(4b)	(6b)	(7a)
1	x			
2			x	
3		x		
4				x