PET 4902E PETROLEUM AND NATURAL GAS ENGINEERING DESIGN II

Course Title		Petroleum and Natural Gas Engineering Design II				
				Course Implementation, Hours/Week		
Code	**Semester**	**Local Credits**	**ECTS Credits**	**Theoretical**	**Tutorial**	**Laboratory**
PET 4902E	8	4	8	1	6	0
Department		Petroleum and Natural Gas Engineering				
Course Type		Compulsory		**Course Language**		English
Course Prerequisites		PET 4901E MIN BB				
Course Category By Content, %		Math & Basic Sciences	Engineering Topics; Check if Contains Significant Design (√)			Other
		-	100√			-

Course Description	Development and use of design methodology. Development of student creativity via open-ended problems. Proposal and management of petroleum engineering projects. Working in teams. Effective technical speaking and writing. Reservoir analysis. Production and field development design considering sustainability aspects.
Course Objectives	1. Provide students an opportunity to work with real data collected from an hydrocarbon or geothermal field 2. Guide students to apply engineering design concepts to open-ended petroleum and natural gas engineering problems by considering sustainability, HSE, and economic factors 3. Develop students' abilities to communicate effectively via technical reports and presentations 4. Develop students' abilities to propose, manage and complete technical projects in a team setting
Course Learning Outcomes	Students who pass the course will be able to: 1. Manage a technical project effectively by meeting deadlines and completing required tasks 2. Apply technical software to solve petroleum engineering problems 3. Work effectively in a team environment through collaboration 4. Write effective reports to present technical work and results that a wide range of audiences including managers, engineers, geoscientists can benefit from 5. Verbally present technical work and results effectively to a wide range of audiences including managers, engineers, geoscientists 6. Apply reservoir engineering principles to understand reservoir behavior and to build a representative reservoir model 7. Recommend a field development design based on economic evaluation and decision analysis 8. Consider sustainability aspects of the recommended field development alternative
Textbook	1. Dake, L.P. (1978). Fundamentals of Reservoir Engineering, Elsevier, Amsterdam 2. Newendorp, P., Schuyler J. (2000) *Decision Analysis for Petroleum Exploration*, Planning Press 3. *Economides, M.J., Hill, A.D., Ehlig-Economides, C., Zhu, D. (2014).Petroleum Production Systems (2nd edition),* Gulf Professional Publishing
Other References	1. Satter, A., Thakur, G.C. (1996). *Integrated Petroleum Reservoir Management: A Team Approach*, PennWell
Homework & Projects	-
Laboratory work	-
Computer Use	-
Other Activities	-

Assessment Criteria	**Activities**	**Quantity**	**Effects on Grading, %**
	Midterms		
	Quizzes		
	Homework		
	Projects		
	Term Paper/Projects	4	85%
	Laboratory Work		
	Other Activities (Teamwork)	3	15%
	Final Exam		

Weeks	Course Plan	Course Outcomes
1	Introduction to the design project	1-5
2	Introduction to the design project	1-5
3	Reservoir analysis	6
4	Reservoir analysis	6
5	Reservoir modeling	6
6	Reservoir modeling	6
7	Reservoir modeling	6
8	Field development design	7
9	Field development design	7
10	Field development design	7
11	Performance evaluation of field development of scenarios	7
12	Economic analysis	7
13	Decision analysis	7
14	Analysis of sustainability aspects	8

Related Performance Indicators
1b. Apply engineering methods to reservoir, drilling and production engineering problems
2b. Consider global, cultural, social, environmental issues in Petroleum, Natural Gas, and Geothermal Engineering design.
2c. Conduct economic analysis in Petroleum, Natural Gas, and Geothermal Engineering design
3a. Communicate effectively by delivering formatted reports
3b. Communicate effectively by delivering oral presentations
5a. Propose a project and complete its required tasks as a team by meeting deadlines
5b. Collaborate in a team's activities to complete a project
7b. Apply new knowledge to tasks relevant to petroleum and natural gas engineering

Relationship of Course Learning Outcomes to the Performance Indicators								
	Performance Indicator							
Course Learning Outcome	**(1b)**	**(2b)**	**(2c)**	**(3a)**	**(3b)**	**(5a)**	**(5b)**	**(7b)**
1						x		
2								x
3							x	
4				x				
5					x			
6	x							
7			x					
8		x						