

PET 309E FLUID AND ROCK PROPERTIES LABORATORY

Course Title		Fluid and Rock Properties Laboratory				
		Course Implementation, Hours/Week				
Code	Semester	Local Credits	ECTS Credits	Theoretical	Tutorial	Laboratory
PET 309E	1	1	3		0	2
Department		Petroleum and Natural Gas Engineering				
Course Type		Compulsory		Course Language		English
Course Prerequisites						
Course Category By Content, %		Math & Basic Sciences	Engineering Topics; Check if Contains Significant Design (√)			Other
		-	100			-

Course Description	Working, safety, and protection rules in fluid and rock properties laboratory. The properties of the reservoir fluids: Densities, API gravities, viscosities, surface and interfacial tensions, flash and fire points of liquid hydrocarbons, water and sediment cut of crude oil, distillation of crude oil. Rock properties: Porosity, saturation, liquid and gas permeabilities, Klinkenberg effect.		
Course Objectives	<ol style="list-style-type: none"> 1. To inform about the physical properties of reservoir fluids and porous media 2. To make familiar with safety handling rules in lab 3. To improve capabilities for teamwork 4. To give an ability to write the technical report 		
Course Learning Outcomes	<p>Students who pass the course will be able to:</p> <ol style="list-style-type: none"> 1. Recognize health, safety and environment related issues in laboratory and field experiments in the petroleum industry 2. Conduct laboratory experiments and write technical reports effectively in a team setting 3. Conduct laboratory experiments to measure reservoir rock and fluid properties 4. Determine physical properties of reservoir rock and fluids experimentally 5. Infer and report engineering conclusions from the analysis and interpretation of experimental data. 6. Communicate effectively via technical and laboratory reports 		
Textbook	<ol style="list-style-type: none"> 1. Mihcakan, I.M., Alkan, K.H., Ugur, Z., Petroleum and Natural Gas Laboratory, Course Notes, ITU, Petroleum and Natural Gas Engineering, Istanbul, Turkey, 2001. 1. Mihcakan, I.M., Safety Manual for Laboratory, TU, Petroleum and Natural Gas Engineering, Istanbul, Turkey, 1999. 		
Other References	<ol style="list-style-type: none"> 1. ASTM Standards on Petroleum Products and Lubricants. 2. TSE Standards on Petroleum Products and Lubricants. 3. API Recommended Practices on Petroleum Products and Lubricants. 4. Bradley, H. B. (Editor-in Chef), Petroleum Engineering Handbook, 1987, SPE, TX, USA. 1. Amyx, J. W., Bass, D.M., and Whiting, R.L., Petroleum Reservoir Eng. Physical Properties, SPE, Richardson, Texas, 1960. 		
Homework & Projects	-		
Laboratory work	Students are assigned to prepare a technical lab. report to analyze the experiment. All reports are to be HANDED IN a week after every experiment.		
Computer Use	The technical reports are required to be prepared by using computer. Therefore, some MS office programs (such as grapher, excel, word, etc.) usage is encouraged throughout the course.		
Other Activities	-		
Assessment Criteria	Activities	Quantity	Effects on Grading, %
	Midterms	1	30
	Quizzes		
	Homework		
	Projects		
	Term Paper/Projects		
	Laboratory Work	9	30
	Other Activities		
Final Exam	1	40	

Weeks	Course Plan	Course Outcomes
1	Safety handling rules in lab	1
2	Safety handling rules in lab	1
3	The relative densities and API gravities of the petroleum and its products	3, 4, 5
4	The viscosities of the petroleum and its products	3, 4, 5
5	The flash and fire points of the petroleum	3, 4, 5
6	General review and evaluation of technical reports	2, 6
7	The surface and interfacial tensions of the petroleum and its products	3, 4, 5
8	The water cut and sediment cut of the petroleum	3, 4, 5
9	The distillation of the petroleum	3, 4, 5
10	General review on the physical properties of reservoir fluids	3, 4, 5
11	Porosity	3, 4, 5
12	Fluid (liquid) permeability	3, 4, 5
13	Gas permeability	3, 4, 5
14	Laboratory cleaning and general review	1

Related Performance Indicators
<p>2a. Consider public health, safety, and welfare issues in Petroleum, Natural Gas, and Geothermal Engineering design.</p> <p>3a. Communicate effectively by delivering formatted reports</p> <p>5b. Collaborate in a team's activities to complete a project</p> <p>6a. Develop and/or execute experiments in Petroleum Engineering applications.</p> <p>6b. Acquire, analyze, and interpret data.</p> <p>6c. Infer and report engineering conclusions from the analysis and interpretation of data</p>

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