Identification	**Course**	**GEOL 310- Petroleum Geology- 6 ECTS credits**
	Department	Petroleum Engineering
	Program	Undergraduate
	Term	Fall 2017
	Instructor	Assoc. Prof. Gasham Zeynalov
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	Class hours	Friday in appointed time
	Office hours	Wednesday 16.00-17.00
Prerequisites	General Geology	
Language	English	
Compulsory/Elective	Required	
Required textbooks and course materials	1. Richard C. Selley and Steve Sonnenberg, 2015, Elements of Petroleum Geology, 3rd edition, Academic Press of Elsevier, 507 pages	
Course objectives	This course is a major subject of a Petroleum Engineering. Objectives of the Course: - to acquaint the student with the key concepts of the origin and generation of hydrocarbons, reservoir rocks and subsurface reservoir structures (traps)which are introduced together with some of the key techniques used within the industry (e.g. reservoir geology, petrophysics and formation evaluation) - to understand concept of the petroleum system, demonstrating how all the elements are necessary for a conventional accumulation of hydrocarbons. - to understand details of reservoir architecture and the factors that influence the performance of reservoirs **Assignment and two quizzes:** First quiz will be based on course materials which had been taught by between 1-6 weeks. Second quiz will be based on course materials which had been taught by between 8-14 weeks. **Practical exercises** will be dedicated to evaluation of SEM images and photomicrographs, unconformities in sedimentary sequence, transgressions and regressions in sedimentary rocks, geological mapping, .petrophysical properties of sedimentary rocks etc.	
Learning outcomes	By the end of the course the students should be able to : - Learn the fundamental principles underlying the main methods of geophysical exploration data and their interpretation as applied to Petroleum Geology - understand importance of Petroleum Geology and nature of hydrocarbon exploration and production, both conventional and unconventional hydrocarbons - learn key concepts of the origin and generation of hydrocarbons, reservoir rocks and subsurface reservoir structures and their trapping mechanisms - demonstrate the ability to integrate knowledge and ideas about petroleum geology topics in a coherent and meaningful manner as evidenced by either responses to projects and exam questions - critically assess petroleum geology concepts associated with various sedimentary basins of various regions of the Earth and competently demonstrate that knowledge in exams	

Teaching methods	Lecture	x
	Group discussion	x
	Experimental exercises	x
	Case studies	x
	Simulation	x

Grades		
	Evaluation Methods	Percentage (%)
	Midterm Exam	30
	Participation	5
	Assignment and quizzes	15
	Practical exercises	10
	Final Exam	40
	Total	100

Academic integrity	Students are responsible for the honest completion and representation of their projects, for the appropriate citation of sources, and for respect of others academic endeavors. Plagiarism and other forms of academic misconduct are serious offenses with severe penalties.

Tentative Schedule

Week	Date/Day	Topics	Textbook/Assignments
1	15.09.2017	Introduction: Historical Review of Petroleum exploration Evaluation of Petroleum Exploration Concepts and Techniques The context of Petroleum Geology Relationship of Petroleum Geology to Petroleum Exploration and Production	Chapt. 1 (1)
2	22.09.2017	Physical and Chemical properties of Petroleum: Natural gases Hydrocarbon gases Nonhydrocarbon gases Gas hydrates Composition and occurrence	Chapt.2 (1)
3	29.09.2017	Methods of Petroleum Exploration: Exploration well drilling Formation Evaluation	chapt.3
4	06.10.2017	Methods of Petroleum Exploration: Geophysical methods of exploration Borehole Geophysics and 4 D seismic	chapt.3
5	13.10.2017	Subsurface Geology Subsurface Geological mapping Remote sensing: Visual remote sensing and Radar , Multispectral scanners	Chapt.3
6	20.10.2017	Subsurface environment: subsurface waters, temperatures, pressures and fluid dynamics	Chapt.4

7	27.10.2017	Generation and Migration of Petroleum Origin of Petroleum: Organic and Inorganic Organic Processes on the Earth surface Formation of Kerogen Petroleum Migration Quiz 1	Chapter 5
8	03.11.2017	Mid-term Exam	
9	10.11.2017	Petroleum System and Basin modelling Hydrocarbon generation and migration	Chapter 5
10	17.11.2017	Reservoir Porosity, Permeability, Capillary pressure Relationship between porosity, permeability and sediment texture Effects of diagenesis on Reservoir quality	Chapt.6
11	24.11.2017	Reservoir Continuity Reservoir Characterization Reserve Calculations Production Methods	Chapt.6
12	01.12.2017	Traps and Seals: Nomenclature of Trap Distribution of petroleum within trap Seals and Cap Rocks Classification of traps	Chapter 7
13	08.12.2017	Sedimentary basins and Petroleum Systems: Mechanism of Basin Formation Classification of Sedimentary basins Distribution of Hydrocarbons in different types of basin	Chapt.8
14	15.12.2017	Nonconventional Petroleum Recourses: Plastic and Solid Hydrocarbons Tar Sands Oil shales Shale Gas and Coal-Bed Methane Quiz 2	Chapt.9
15	22.12.2017	Prospects and Probabilities: Prospect Appraisal Geological aspects Economic Aspects Reserves and Resources	Chapt.10
	TBA	**Final Exam**	