Identification	**Subject**	PETE 417 Petroleum Engineering Design 6 ECTS	
	Department	Petroleum Engineering	
	Program	Undergraduate	
	Term	Spring, 2023	
	Instructor	Grigorii Penkov	
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	Classroom/hours	TBC	
	Office hours	Monday 10:00-17:00	
Prerequisites	Consent of instructor		
Language	English		
Compulsory/Elective	Required		
Required textbooks and course materials	*1. Tiab, Djebbar, and Erle C. Donaldson. Petrophysics: theory and practice of measuring reservoir rock and fluid transport properties. Gulf professional publishing, 2015.* *2. Reservoir engineering: Heriot-Watt University, Department of Petroleum Engineering, Edinburgh, UK 2004, 814 p.* *3. Ahmed, Tarek. Reservoir engineering handbook. Gulf professional publishing, 2018.* *4. Drilling engineering: Heriot-Watt University, Department of Petroleum Engineering, Edinburgh, UK 2004, 645 p.* *5. Chaudhry, Amanat. Oil well testing handbook. Elsevier, 2004.* 6. *Laik, S. Offshore petroleum drilling and production. CRC Press.2018*		
Course outline	*Basic Objective of the Course:* ▪ Understand how to evaluate and characterize reservoirs, including reservoir properties, fluid behavior, and geological considerations. Learn to use this information for reservoir modeling and design. *Specific Objectives of the Course:* ▪ Develop skills in reservoir management, including strategies for efficient hydrocarbon recovery, field development planning, and depletion strategies. ▪ Learn how to design production systems, including well placement, artificial lift methods, and surface facilities, to optimize oil and gas production. ▪ Explore well design principles, including casing and tubing selection, drilling techniques, and drilling fluid properties. Learn to design wells that maximize production and minimize operational risks.		
Course objectives	The purpose of teaching disciplines is to acquire knowledge in the field of oil and gas field development as the basis for studying the oil and gas business. The main task of studying the disciplines is representatives of student ideas about the basics of the development of oil and gas fields		
Learning outcomes	• Basics of development of oil and gas fields; • Systems and technologies for the development of oil and gas fields; • Design principles, rational development of oil and gas fields; • Formulate and calculate different types of fluid flow in reservoir • Formulate and calculate flow in reservoir for any kind of geometry • Analyzing fluid flow through in porous media • Understand how to solve unsteady state PDE. • Application relative permeability curves in reservoir engineering problems		
Teaching methods	Lecture		X
	Group discussion		X
	Experiential exercise		X
	Case analysis		X
Evaluation	Methods	Date/deadlines	Percentage (%)
	Midterm Exam		30
	Class Participation		5
	Assignment and quizzes		10

	Project	10 December	15
	Final Exam		40
	Total		100

Policy

Class assignments will be provided during class. The contents will be based on the calculation of formation properties etc.
Project will mainly include case studies. Research skills and the techniques learnt during class assignments and practical exercises will be the tools to complete the projects.
Quizzes will cover the materials studied in previous classes. There will be 1 quizze during the semester.

A midterm exam is an exam given near the middle of an academic grading term or near the middle of any given quarter or semester. The purpose of the examination is that students have a better idea of whether they're advancing well in the course.

The student receives 5 bonus points at the end of the semester if they attend all classes and follow all course policies and procedures.

Assessment of the participant's activity in lectures, practical classes and in the learning process in general.

A quiz is a quick assessment of student knowledge to test a students' level of comprehension briefly regarding course material, providing teachers with insights into student progress and any existing knowledge gaps.

A project is a collaborative activity of students relating to scientific research. The reasons for including projects in the subject course is to show prospective students and research activity on the subject.

A final examination is an exanimation administered at the end of an academic term, with a set of questions or exercises evaluating the skill or knowledge of students given to students at the end of a course of study.

- **Preparation for class**

  The structure of this course makes your individual study and preparation outside the class extremely important. The lecture material will focus on the major points introduced in the text. Reading the assigned chapters and having some familiarity with them before class will greatly assist your understanding of the lecture.

- **Withdrawal (pass/fail)**

  A student is normally expected to achieve a mark of at least 60% to pass. In case of failure, he/she will be required to repeat the course the following term or year.

- **Cheating/plagiarism**

  Cheating or other plagiarism during the Quizzes, Mid-term and Final Examinations will lead to paper cancellation. In this case, the student will automatically get zero (0), without any considerations.

- **Professional behavior guidelines**

  The students shall behave in the way to create favorable academic and professional environment during the class hours. Unauthorized discussions and unethical behavior are strictly prohibited.

- **Expected behavior**

	Includes attending all class activities; meeting deadlines; observing common courtesies to fellow students, teachers, and staff; being honest; making a diligent effort to learn; and does not engage in any disruptive irresponsible manner. Legitimate collaboration is encouraged but academic collusion or dishonesty will not be tolerated

Tentative Schedule

Week	Date/Day (tentative)	Topics	Textbook/Assignments
1	Week 1	Introduction To Reservoir Engineering	2-3
2	Week 2	Reservoir pressures and temperatures. Fundamental properties of reservoir rocks	1-4
3	Week 3	Fundamental fluid properties	1-4
4	Week 4	Fluid flow in porous media	2-4
5	Week 5	Oil and gas wells	2-4
7	Week 6	Reserve estimating	2
8	Week 7	Material Balance Equation	2-3
9	Week 8	**Mid-Term Exam**	
10	Week 9	Reservoir drive mechanisms	2-3
11	Week 10	Principles of waterflooding	3
12	Week 11	Well test	5
13	Week 12	Enhanced Oil Recovery	Lecture Notes
14	Week 13	Overview of Subsea Engineering	6
15	Week 14	Subsea Field Development	6
16	Week 15	Overall revision and preparation for exam	
	TBA	**Final Exam**	

This syllabus is a guide for the course and any modifications to it will be announced in advance.