Identification	**Subject**	PETE323, Petroleum Reservoir Engineering, 8 ECTS
	Department	Petroleum Engineering
	Program	Undergraduate
	Term	Spring 2026
	Instructor	Kanan Mammadov
	E-mail:	kanan.mammadov@khazar.org
Prerequisites		
Language	English	
Compulsory/Elective	Compulsory	
Required textbooks and course materials	***Textbooks:*** • *Reservoir Engineering Handbook, Tarek Ahmed, Fourth Edition, 2010* • *Reservoir Engineering Fundamentals and Applications, Sylvester Okotie, Bibobra Ikporo, 2019* • *Basics of Reservoir Engineering, R.Cosse. 1993* • *Petroleum Engineering Handbook Volume V – Reservoir Engineering and Petrophysics,Edward D. Holstein, Larry W. Lake, 2007* ***Additional textbook:*** • *Fundamentals of Reservoir Engineering, L.P. Dake, 1978*	
Course description	The Reservoir Engineering course provides a comprehensive understanding of the principles and methodologies used to analyze, develop, and optimize hydrocarbon reservoirs. This course bridges theoretical concepts with practical applications, equipping students with the skills needed to evaluate reservoir performance, estimate reserves, and make informed decisions for efficient resource management. Students will begin with foundational topics such as reservoir geology, geophysics, and the properties of reservoir fluids and rocks. As the course progresses, they will delve into advanced concepts like fluid flow dynamics, pressure and temperature analysis, material balance equations, and enhanced oil recovery mechanisms. The integration of core topics such as Darcy's Law, PVT analysis, and well inflow equations provides students with a holistic understanding of reservoir behavior.	
Course objectives	This course is aimed at understanding the rock and fluid properties of a hydrocarbon reservoir. The course covers the nature of fluid flow and pressure distribution within a reservoir and also looks at the effect of production or injection on flow and pressure, and therefore on the recovery of reserves from the reservoir. The overall aim of this course is to allow the student to: Understand the rock and fluid properties of a hydrocarbon reservoir Describe the nature of the fluid flow and pressure distribution in a reservoir Understand the effects of production/injection on recovery of reserves	
Learning outcomes	Upon successful completion of this course, students will be able to: • describe fundamental reservoir rock and fluid properties;	

<table>
<tr><td></td><td colspan="3">

- analyze reservoir pressure behavior and identify dominant drive mechanisms;
- explain the basic principles of fluid flow in porous media;
- apply material balance concepts to estimate hydrocarbons in place;
- evaluate well and reservoir performance using analytical methods;
- interpret reservoir and production data to support production forecasting and basic field development decisions.

</td></tr>
<tr><td rowspan="5">Teaching methods</td><td colspan="2">Lecture</td><td>x</td></tr>
<tr><td colspan="2">Group assignment</td><td>x</td></tr>
<tr><td colspan="2">Simulation</td><td>x</td></tr>
<tr><td colspan="2">Case analysis</td><td>x</td></tr>
<tr><td colspan="2">Others</td><td></td></tr>
<tr><td rowspan="7">Evaluation</td><td>Methods</td><td>Date/deadlines</td><td>Percentage (%)</td></tr>
<tr><td>Midterm Exam</td><td></td><td>30</td></tr>
<tr><td>Class Participation</td><td></td><td>15</td></tr>
<tr><td>Project</td><td></td><td>15</td></tr>
<tr><td>Final Exam</td><td></td><td>40</td></tr>
<tr><td>Others</td><td></td><td></td></tr>
<tr><td>Total</td><td></td><td>100</td></tr>
<tr><td>Policy</td><td colspan="3">

- Quizzes will be provided during the classes, and they are to be based on the topic covered during the classes. Random quizzes during semester are for the instructor to decide the eligibility of student for the semester project.
- Group based practical project is going to be given in order to illustrate the practical significance of the theory taught in the classes. The project represents a collective endeavor undertaken by students within the realm of scientific inquiry. The incorporation of this project into the curriculum serves the dual purpose of showcasing the subject's research endeavors to potential students and illuminating the ongoing scholarly activities within the field.
- Midterm will be carried out in the week announced by the university. Time allocated will be announced close to the midterm. Its primary objective is to provide students with a clearer assessment of their progress within the course, enabling them to gauge their performance and understanding up to that point.
- Final exam date and time will be defined by the University. A final examination is an evaluative assessment presented to students at the conclusion of an academic term or course of study. This assessment typically consists of a predefined set of questions or exercises designed to gauge students' proficiency and comprehension of the subject matter.
- NO CELL PHONES are allowed during lecture. PLEASE turn them off before lecture! (Not silent or vibrating mode). This is a university policy and accepted by the department of PE, and violators will be reprimanded accordingly.

</td></tr>
</table>

	• **Participation and interaction in classes are more important than just attendance.** • No late tasks/homework will be accepted. Homework is to be completed on an individual basis. Students may discuss homework with classmates, but students are responsible for their own work. If students have consulted classmates, please note the individuals name on the top of students' assignment. • No late assignments will be accepted without prior arrangement with the instructor for acceptable excuses. Medical and family emergency will be considered on case-by-case basis. Note that inability to participate in quiz or presentations will not be accepted, and YOU WILL NOT HAVE A SECOND CHANCE TO PRESENT YOUR RESULTS OR PARTICIPATE IN QUIZZES. IN CASE OF ABSENCE, YOU WILL HAVE TO PRESENT "ARAYIŞ" TO THE INSTRUCTOR. • Quizzes may be given unannounced throughout the term. • There will be no make-up quizzes. • No make-up exams. If students miss an exam, a zero score will be assigned to the missed exam. • If students should miss class due to personal emergency or medical reasons, please notify the instructor by email immediately. A doctor's note will be required for make-up work. • Students are responsible for completing the reading assigned from the textbook related to the covered topics and for checking email regularly for important information and announcements related to the course. • Any form of plagiarism or cheating on a proposal, work plan, bibliography, presentation of literature review, final report will result in the cancellation of the work. In this case, the student will receive a mark of 0 without any further consideration. After identification cheating or plagiarism, NO CHANCE will be given for correction and rewrite report. • University policy on academic honesty concerning exams and individual work will be strictly enforced.

Tentative Schedule

Week	Date/Day (tentative)	Topics	Textbook/Assignments
1		Introduction, Reservoir Geology and Geophysics	Basics of Reservoir Engineering, R.Cosse **Introduction and Chapter 1**
2		Resources and Reserves	Reservoir Engineering Fundamentals and Applications, Sylvester

			Okotie, Bibobra Ikporo **Chapter 2, Resources and Reserves**
3		Reservoir Pressure and Temperature	1.Reservoir Engineering Fundamentals and Applications, Sylvester Okotie, Bibobra Ikporo **Chapter 8, Pressure Regimes and Fluid Contacts** 2.Petroleum Engineering Handbook Volume V – Reservoir Engineering and Petrophysics, Larry W. Lake **Chapter 7, Reservoir Pressure and Temperature**
4		Reservoir Fluid Behavior	Reservoir Engineering Handbook, Tarek Ahmed, Fourth Edition **Chapter 1, Fundamentals of Reservoir Fluid Behavior**
5		Reservoir Fluid Properties	Reservoir Engineering Handbook, Tarek Ahmed, Fourth Edition **Chapter 2, Reservoir Fluid Properties**
6		**Mid-term Exam**	
7		Fundamentals of Rock Properties	Reservoir Engineering Handbook, Tarek Ahmed, Fourth Edition **Chapter 4, Fundamentals of Rock Properties**
8		Relative Permeability Concepts	Reservoir Engineering Handbook, Tarek Ahmed, Fourth Edition **Chapter 5, Relative Permeability Concepts**

9		Fundamentals of Reservoir Fluid Flow-Part 1	Reservoir Engineering Handbook, Tarek Ahmed, Fourth Edition **Chapter 6, Fundamentals of Reservoir Fluid Flow**
10		Fundamentals of Reservoir Fluid Flow-Part 2	
11		Oil Recovery Mechanisms	Reservoir Engineering Handbook, Tarek Ahmed, Fourth Edition **Chapter 11, Oil Recovery Mechanisms and the Material Balance Equation**
12		Material Balance Equation	
13		**Project**	
14		**Course Overview** **Mock Exam**	
15		**Project Presentations**	
	TBC	**Final Exam**	

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