Identification	**Subject**	PETE 531 – Formation Evaluation – 8 ECTS credits	
	Department	Petroleum Engineering	
	Program	Graduate	
	Term	Fall, 2023	
	Instructor	Ulviyya Asgarova	
	E-mail:	ulviyya.asgarova@khazar.org	
	Classroom/hours	11 Mehseti str. (Neftchilar campus), Tuesday 18:40- 21:00	
Prerequisites	Petroleum Geology, Basics of Geoscience, Drilling Engineering Fundamentals		
Language	English		
Compulsory/Elective	Compulsory		
Required textbooks and course materials	***1.*** Dr. Paul W.J. Glover, Formation Evaluation MSc Course Notes, University of Aberdeen ***2.*** George Asquith and Daniel Krygowski, (second edition), Basic Well Log Analysis, 2004 ***3.*** Darling, T., 2005, "Well Logging and Formation Evaluation", Gulf Pub. ***4.*** Rider, M., 2004, "The Geological Interpretation of Well Logs", Rider-French Consulting, Ltd.		
Course outline	Formation Evaluation course is designed for the bachelor and master students. It includes main principles of formation evaluation and basic well logging methods, covering gamma ray (GR), spontaneous potential (SP), resistivity, caliper, density, neutron, acoustic and formation pressure measurements. What is more, interpretation of well logs, and their cross plotting techniques, well-to-well correlations, determination of formation properties such as porosity, permeability, hydrocarbon saturation, lithology, zone thickness (net thickness, gross thickness, net pay), shaliness (shale volume), etc. and guidance on selection of proper well logs in given field conditions is addressed throughout the course.		
Course objectives	Basic Objective of the Course: ▪ To equip students with the main concepts, methods and techniques of well logging and interpretation of well logs. ▪ Develop opportunities for students to advance work-related skills Specific Objectives of the Course: ▪ To support the students academically, to improve their chance of realizing their potential ▪ To develop an understanding of the theory and practice of managerial analysis, and strategic decision making ▪ To develop an understanding of the theory in Well logging ▪ To furnish of students with the "Interpretation charts" ▪ To build background for the students further Well logging interpretation **Presentation/Group Discussion** – to evaluate the students' individual presentation skills and ability to work in groups.		
Learning outcomes	**By the end of the course the students should be able:** ▪ To perform quick look interpretation of well logs ▪ To perform log interpretation of real case studies (by providing students with actual well log data) ▪ To estimate formation rock properties based on well logs ▪ To perform well-to-well correlation of logs to identify geological signatures of formation rocks ▪ To understand the math and physics behind each measurement technique		
Teaching methods	**Lecture**		x
	Group discussion		x
	Practical exercises		x
	Case analysis		x
Evaluation	**Methods**	**Date/deadlines**	**Percentage (%)**
	Midterm Exam		30

	Class Participation		5
	Quizzes		10
	Presentation/Group Discussion		15
	Final Exam		40
	Total		100

Policy

Quizzes will cover the materials covered in previous classes and will be consist of open-ended questions. Quizzes will be distributed throughout the classes. Overall 10 points will be given for two quizzes (5 for each). There will be 2 quizzes during semester. Anticipated week for the quizzes are week 7 and 13. Date and time will be announced a week before.

The student receives 10 bonus points for the class participation and activity at the end of the semester if they attend all classes and follow all course policies and procedures.

Midterm exam will be carried out in the week announced by the university. Time allocated will be announced close to the midterm. A midterm examination is a test administered approximately midway through an academic grading term, be it a quarter or semester. 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.

Presentation/Group Discussion will be conducted close to the end of semester in December. Date and time will be announced during the semester. A presentation/group discussion is a collaborative activity of students relating to research about formation evaluation techniques. The reasons for including a presentation/group discussion in the subject course is to evaluate the students' individual presentation skills and ability to work in groups.

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. 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.

- **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. After the lecture, you should study your notes and assigned chapters. Throughout the semester students will also have quizzes.

- **Withdrawal (pass/fail)**

This course strictly follows grading policy of Graduate School of Science, Art and Technology. Thus, 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.

- **Class attendance**

Attendance is required! Please be in class on time. Attendance will be taken at the beginning of each class period. In case you are not present when attendance sheet is passed on, you will be marked absent. If students who are late for lessons for more than 10 minutes to class will be marked absent, despite this, the student can still attend the class. You shall receive 5 bonus points at the end of the semester if you attend all classes and follow all course policies and procedures.

- **Class discussion**

Feel free to voice your opinions and ask questions anytime during a class period. Practice your right and freedom to learn. Remember you are here to learn and we are here to teach and that teaching and learning are forever intertwined. You can help me teach you as much as I can help you learn. Be an active participant in the learning process!

Tentative Schedule

Week	Date/Day (tentative)	Topics	Textbook
1		Introduction to Well logging, History and logging principles Borehole Environment	Ch.1
2		Gamma Ray Log (tool physics and application)	Ch.2
3		Gamma Ray Log (shale volume estimation and well-to-well correlation)	Ch.2
4		SP and Caliper Logs (tool physics, application and limitations)	Ch.3
5		Resistivity logs (tool physics, application and limitations)	Ch.4
6		Saturation calculation methods. Cross plot techniques	Ch.5
7		**Quiz 1**	
8		**Mid-term Exam**	
9		Density logs (tool physics, application and limitations)	Ch.6

10		Neutron logs (tool physics, application and limitations)	Ch.7
11		Acoustic Logs (tool physics, application and limitations)	Ch.8
12		Formation Pressure Measurements (tool physics, application and limitations)	Ch.9
13		**Quiz 2**	
14		**Presentation/Group Discussion**	
15		**Presentation/Group Discussion**	
	TBA	**Final Exam**	

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