Identification	**Subject**	PETE 531 Formation Evaluation 8 ECTS credits
	Department	Petroleum Engineering
	Program	Graduate
	Term	Fall, 2022
	Instructor	Samir Muzaffarov
	E-mail:	samir.muzaffarov@khazar.org
	Phone:	+994519106686
	Classroom/hours	
	Office hours	
Prerequisites	Petroleum Geology, Basics of Geoscience, Drilling Engineering Fundamentals	
Language	English	
Compulsory/Elective	Elective	
Required textbooks and course materials	1. *Dr. Paul W.J. Glover, Formation Evaluation MSc Course Notes, University of Aberdeen* 2. *Darvin V. Ellis, Julian M. Singer, 2008. "Well Logging for Earth Scientists"* 3. *George Asquith and Daniel Krygowski, (second edition), Basic Well Log Analysis, 2004* 4. *Darling, T., 2005, "Well Logging and Formation Evaluation", Gulf Pub.* 5. *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	
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
	Assignments		10
	Quizzes		5
	Project		10
	Final Exam		40
	Total		100

Policy

- **Class assignments** will be provided during class. The contents will be based on log interpretation, calculation of formation properties etc.
- **Quizzes (multiple choice questions)** will cover the materials covered in previous classes. There will be 2 quizzes during semester.
- **Project** will mainly include case studies. Research skills and the techniques that learnt during class assignments and practical exercises will be the tools to complete the projects.
- **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, assigned chapters and get ready for class assignments. Throughout the semester students will also have practical exercises and 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 you are late for more than 10 minutes you will not be allowed into the classroom not to cause distraction. You will receive a Dean's warning if you miss more than 3 classes and shall be dismissed from the course if you miss more than 5 classes. 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/Assignments**
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) Class assignment 1	Ch.2
4		SP and Caliper Logs (tool physics, application andlimitations) Class assignment 2	Ch.3
5		Resistivity logs (tool physics, application and limitations) Class assignment 3	Ch.4
6		Saturation calculation methods. Cross plot techniques Class assignment 4	Ch.5
7		Practical exercises of log interpretation and formation property calculations Class Assignment 5 **Quiz 1**	
8		**Mid-term Exam**	
9		Density logs (tool physics, application and limitations) Class Assignment 6	Ch.6
10		Neutron logs (tool physics, application and limitations) Class assignment 7	Ch.7
11		Acoustic Logs (tool physics, application and limitations) Class assignment 8	Ch.8
12		Formation Pressure Measurements (tool physics, application andlimitations) Class assignment 9	Ch.9
13		Practical exercises of log interpretation and formation property calculations **Quiz 2**	
14		Project Presentations	
16	TBA	**Final Exam**	

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