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| **Identification** | **Subject**  | PETE 531- Formation Evaluation– 4 credits  |
| **Department** | Petroleum Engineering |
| **Program** | Graduate |
| **Term** | Fall, 2015 |
| **Instructor** | PhD. Elnur Amirov |
| **E-mail:** | eamirov@khazar.org |
| **Phone:** | (+994 12) 421-10-93 |
| **Classroom/hours** | 11 Mehseti str. (Neftchilar campus), Saturday 12:00-15:00 |
|  | **Office hours** | Saturday, 12:00 – 15:00 or by appointment |
| **Prerequisites** | Consent of instructor |
| **Language**  | English |
| **Compulsory/Elective** | Required |
| **Required textbooks and course materials** | ***Core textbook:******Formation Evaluation,*** *Heriot-Watt University, Edinburgh, UK, 2005****.******Supplementary:******1. No more waiting: Formation Evaluation While Drilling.*** *Bob Adolph, Chris Stoller, USA, 2005.****2.***  ***Fundamentals of Formation Evaluation.*** *Mohd Fauzi Hamid, Wan Rosli Wan Sulaiman, Universiti Technologi Malaysia, 2015.* |
| **Course website** |  |
| **Course outline** | This course is designed for the master students. Course addresses principles of open hole logging, log data acquisition, data processing & transmission, log runs & presentations, rock & fluid properties, tools and logs measurements, interpretation of porosity, saturation determination, Data from Fluid Sampling, Well Testing (Pressure Transient Analysis & etc.  |
| **Course objectives**  | *Generic Objective of the Course:** To equip students with the core concepts, methods and techniques of formation evaluation.

*Specific Objectives of the Course:** To develop an understanding of the theory in Formation Evaluation
* To furnish of students with the “Interpretation & Evaluation”
* To build background for the students to perform further Formation Evaluation
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| **Learning outcomes** | **By the end of the course the students should be able to learn:*** Evaluation of formation/reservoir properties
* Identification of permeable and non-permeable zones from logs
* Different types of Log data acquisition, data processing & transmition, log runs & presentations
* Procedures used in log interpretation
* Correlation and depth match of logs and interpretation lithology
* Log Measurements and tools
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| **Teaching methods** | **Lecture**  | x |
| **Group discussion** | x |
| **Experiential exercise** | x |
| **Simulation** |  |
| **Case analysis** | x |
| **Course paper** |  |
| **Others** |  |
| **Evaluation**  | **Methods** | **Date/deadlines** | **Percentage (%)** |
| **Midterm Exam** |  | 30 |
| **Case studies** |  | 10 |
| **Class Participation** |  | 5 |
| **Assignment and quizzes** |  | 15 |
| **Project** |  |  |
| **Presentation/Group Discussion** |  |  |
| **Final Exam** |  | 40 |
| **Others** |  |  |
| **Total**  |  | 100 |
| **Policy** | * **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 work relevant problems and cases from the end of the chapter and sample exam questions.Throughout the semester we will also have an assignment and quizzes. * **Withdrawal (pass/fail)**

This course strictly follows grading policy of the School of Engineering and Applied Science. Thus, a student is normally expected to achieve a mark of at least 65% 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. **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. |
| **Tentative Schedule** |
| **Week** | **Date/Day****(tentative)** | **Topics** | **Textbook/Assignments**  |
| 1 | 19.09.15 | Introduction to Formation EvaluationHistory and terminology | Ch.1 |
| 2 | 26.09.15 | The Field OperationLog data acquisition, Data processing & transmition, log runs & presentations | Ch.1 |
| 3 | 03.10.15 | Rock and fluid properties, rock classification system, porosity  | Ch.2 |
| 4 | 10.10.15 | Saturation, permeability, capillary pressure, fluid properties, water salinity, determination of formation temperature | Ch.2 |
| 5 | 17.10.15 | QUIZ 1Knowledge sharing session (formation evaluation) |  |
| 6 | 24.10.15 | Summary of Procedures Used in interpretationCorrelate and depth match logsInterpret lithology | Ch.3 |
| 7 | 31.10.15 | Identification of permeable and non-permeable zones from logs Determine and divide the formations into water bearing and hydrocarbon bearing zonesDetermine the porosity of the zones of interestDetermination of saturation | Ch.3 |
| 8 | 07.11.15 | **Mid-term Exam** |  |
| 9 | 14.11.15 | Log Measurements and Tools Gamma rays and gamma ray Spontaneous potentialPropagation of sound and the acoustic tool  | Ch.4 |
| 10 | 21.11.15 | Gamma ray scattering and density logging tools Neutron scattering and neutron logging tools Resistivity of formations and resistivity tools | Ch.4 |
| 11 | 28.11.15 | QUIZ 2Knowledge sharing session (formation evaluation) |  |
| 12 | 05.12.15 | Interpretation of porosity | Ch.5 |
| 13 | 12.12.15 | Lithology and porosity in complex formations | Ch.6 |
| 14 | 19.12.15 | Neutron-Density crossplots Sonic-Density crossplots  | Ch. 6 |
| 15 | 26.12.15 | Saturation DeterminationResistivity ratio methodsShaly formationsMicroresistivity vs porosity crossplotsData from Fluid Sampling Well Testing (Pressure Transient Analysis) | Ch. 7 |
|  | TBA | **Final Exam** |  |

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