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|  **COURSE DETAILS** |
| **Course Name** | **FORMATION EVALUATION** |

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| **Language of Instruction** | Turkish |

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| **Level of Instruction** | Associate | Undergraduate  | MSc(X) | Ph.D. () |

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| **Education System** |
| Formal Education (X) | Distance Education () | Other |

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| **Type of Course** | **Course Area Code** | **Course Optical Code** |
| Comp () | Elective (x) |  |  |

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| **Theory** | **Practice Time** | **Total Hours** | **Semester** | **National Credit** | **ECTS Credits** |
| 3 | 0 | 3 | Spring | 3 | 6 |

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| **Course Aim** |

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|  | The aim of this course is to provide an advanced understanding of of the rock properties and formation evaluation and well logging as well as the physical principles of the tools used in logging. They will also learn to characterise the formation based on interpretation of well logs. |

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| **Course Content** |

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| Basic concepts. Rock and fluid properties. Resistivity logs, SP log, normal and lateral logs, induction logs, microresistivity logs. Other logs, gamma ray log, density log, neutron log. Interpret the log to discern porosity, water saturation, lithology, hydrocarbon content. Synthesize the interpretations of several logs and produce a consistent interpretation of the reservoir. |  |

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| **Prerequisites**  | * Understand the properties of rocks and fluids that produce characteristic signals
* Read and interpret a well log
* Analyse the data and correct for environmental factors
* Interpret the log to discern porosity, water saturation, lithology, hydrocarbon content
* Synthesize the interpretations of several logs and produce a consistent interpretation of the reservoir
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| **Course Instructor** | Asist Prof. Derya KOCA |

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| **Assistant Instructor** |   |

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| **Text Book / Recommended Reading** | Darling, T., 2005. Well Logging and Formation Evaluation, Gulf Professional Publishing, Oxford, 326p.Serra, O, 1984. Fundamentals of Well Log Interpretation, Elsevier SPC, 423p.Liu, H., 2017. Principles and Applications of Well Logging. Springer Geophysics, 356p. |

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| **Grading Evaluation System** |
| (X) Direct Conversion System |   | () Curve |
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|  | **Tools** | **Number** | **Rate** |
|  | Attendance and Participation | 15 | 5 |
|  | Research homework | 1 | 15 |
|  | Quiz | 4 | 16 |
| **Measurement and Evaluation** | Presentations | 1 | 10 |
|  | Literature | 1 | 4 |
|  | Semester Exam | 1 | 50 |
|  | **Total** |  | **100%** |

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| **Subjects by Week** |
| **Week** | **Topics** | **Teaching Methods** |
| 1 | Introduction | Lecture, discussion, sampling. |
| 2 | Basic concepts | Lecture, discussion, sampling. |
| 3 | Rock and fluid properties | Lecture, discussion, sampling. |
| 4 | Well logs | Lecture, discussion, sampling. |
| 5 | Resistivity logs,.  | Lecture, discussion, sampling. |
| 6 | SP log, normal and lateral logs, induction logs, microresistivity logs | Lecture, discussion, sampling. |
| 7 | Gamma ray log | Lecture, discussion, sampling. |
| 8 | Density log | Lecture, discussion, sampling. |
| 9 | Neutron log. | Lecture, discussion, sampling. |
| 10 | Sonic log | Lecture, discussion, sampling. |
| 11 | Formation evaluation with well logging | Lecture, discussion, sampling. |
| 12 | Interpret the log to discern porosity, water saturation, lithology, hydrocarbon content | Lecture, discussion, sampling. |
| 13 | Interpret the log to discern porosity, water saturation, lithology, hydrocarbon content | Lecture, discussion, sampling. |
| 14.  | Synthesize the interpretations of several logs and produce a consistent interpretation of the reservoir | Lecture, discussion, sampling. |
| 15 | Synthesize the interpretations of several logs and produce a consistent interpretation of the reservoir | Lecture, discussion, sampling. |
| 16 | Synthesize the interpretations of several logs and produce a consistent interpretation of the reservoir | Lecture, discussion, sampling. |
| 17 | Final  | Written exam |

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| **Program Outcomes** | 01 | 02 | 03 | 04 |
| PO 01  | Understand the properties of rocks and fluids that produce characteristic signals | 5 | 4 | 4 | 5 |
| PO 02 | Read and interpret a well log | 4 | 5 | 5 | 4 |
| PO 03 | Analyse the data and correct for environmental factors | 5 | 4 | 4 | 5 |
| PO 04 |  Interpret the log to discern porosity, water saturation, lithology, hydrocarbon content | 5 | 5 | 5 | 5 |
| PO 05 | Synthesise the interpretations of several logs and produce a consistent interpretation of the reservoir | 5 | 5 | 5 | 5 |

\* 1: Very Low 2: Low 3: Medium 4: High 5: Very high

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| **Student workload / ECTS account**  |
| **Activities** | **Number** | **Preparation** | **Duration of Activity** | **Total Workload** |
| Theoretical Course | 15 | - | 3 | 45 |
| Scientific homework  | 2 | - | 15 | 30 |
| The library search | 5 | - | 15 | 75 |
| Presentation | 2 | - | 10 | 20 |
| Quiz | 1 | - | 2 | 2 |
| Semester Exam | 1 | - | 2 | 2 |
| Total Workload (Hour) | 23 |  |  | 174 |
| Roll [Total Workload (hours) / week work load (30)] = ECTS Credit | 174/30=6 |