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|  **COURSE DETAILS** |
| **Course Name** | Phase Behavior of Petroleum Reservoir Fluids |

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| **Language of Instruction** | Turkish |

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| **Level of Instruction** | Associate | Undergraduate  | MA(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 | Fall | 3 | 6 |

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| **Course Aim** |

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|  | The aim of this course is to provide an advanced understanding of the basic principles and principles of phase behavior of reservoir fluids and to gain the ability to apply the principles and equations in solving related problems. |

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| **Course Content** |

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|  | Classification of petroleum hydrocarbons, classification of reservoir fluids according to phase behavior, basic principles of phase behavior in gas-liquid hydrocarbon systems, phase equilibrium, state equations, calculations about phase behavior, fluid characterization, gas injection, interface tension, pressure for liquid and gas hydrocarbons PVT experimental methods and correlations describing the relationship between volume, temperature and volume. |

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| **Prerequisites**  | • Define the phase behavior of hydrocarbons,• Solve problems related to phase behavior,• Characterize fluids,• Analyze the pressure, volume and temperature relationship of hydrocarbons at an advanced level,• Will be able to apply PVT experimental methods. |

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| **Course Instructor** | Assistant Professor Hasan SAYĞILI |

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| **Assistant Instructor** |   |

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| **Text Book / Recommended Reading** | * Ahmed, T., Hydrocarbon Phase Behavior, Gulf Publishing Company,Houston,Texas,1989.
* Pendersen, K.S., Christensen, P.L., Phase Behavior of Petroleum Reservoir Fluids, CRC Press Taylor & Francis Group, 2007.
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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 | Classification of hydrocarbons | Lecture, discussion, sampling. |
| 2 | Classification of reservoir fluids according to phase behavior | Lecture, discussion, sampling. |
| 3 | Basic principles of phase behavior in gas-liquid hydrocarbon systems | Lecture, discussion, sampling. |
| 4 | Basic principles of phase behavior in gas-liquid hydrocarbon systems | Lecture, discussion, sampling. |
| 5 | Basic principles of phase behavior in gas-liquid hydrocarbon systems | Lecture, discussion, sampling. |
| 6 | Phase balance | Lecture, discussion, sampling. |
| 7 | Phase balance | Lecture, discussion, sampling. |
| 8 | State equations | Lecture, discussion, sampling. |
| 9 | Calculations related to phase behavior | Lecture, discussion, sampling. |
| 10 | Fluid characterization | Lecture, discussion, sampling. |
| 11 | Gas injection | Lecture, discussion, sampling. |
| 12 | Interfacial tension | Lecture, discussion, sampling. |
| 13 | P, V and T relationship in gas and liquid hydrocarbons | Lecture, discussion, sampling. |
| 14.  | PVT experimental methods and correlations | Lecture, discussion, sampling. |
| 15 | PVT experimental methods and correlations | Lecture, discussion, sampling. |
| 16 | Solution of phase equilibrium problems | Lecture, discussion, sampling. |
| 17 | Final  | Written exam |

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| **Program Outcomes** | 01 | 02 | 03 | 04 |
| PO 01  | Define the phase behavior of hydrocarbons. | 5 | 4 | 4 | 5 |
| PO 02 | Solve problems related to phase behavior. | 4 | 5 | 5 | 4 |
| PO 03 | Characterize fluids. | 5 | 4 | 4 | 5 |
| PO 04 | Analyze the pressure, volume and temperature relationship of hydrocarbons at an advanced level. | 5 | 5 | 5 | 5 |
| PO 05 | Determine energy and mass balance for thermodynamic systems. | 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 | 14 | - | 3 | 42 |
| Scientific homework  | 14 | - | 2 | 28 |
| The library search | 2 | - | 10 | 20 |
| Presentation | 2 | - | 15 | 30 |
| Quiz | 1 | - | 30 | 30 |
| Semester Exam | 1 | - | 40 | 40 |
| Total Workload (Hour) | 34 |  |  | 190 |
| Roll [Total Workload (hours) / week work load (30)] = ECTS Credit | 190/30=6,33 |