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|  **COURSE DETAILS** |
| **Course Name** | Gas Hydrates |

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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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|  | * To analyze the chemical structure of gas hydrates
* To provide the properties of gas hydrate reservoirs
* To analyze the exploration and production methods for gas hydrate reservoirs
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| **Course Content** |

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| Definition of hydrates, Gas hydrate reservoirs, Geophysics of gas hydrates, Well logging of gas hydrates, Drilling and coring of gas hydrates, Well completion of gas hydrates, Production of gas hydrates |  |

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| **Prerequisites**  | - |

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| **Course Instructor** | Assistant Professor Şükrü MEREY |

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| **Assistant Instructor** |   |

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| **Text Book / Recommended Reading** | - Max, M.D., Johnson, A.H. (2016). Exploration and Production of Oceanic Natural Gas Hydrate. Springer, ISBN: 978-3-319-43384-4. - Sloan, E.D., Koh, C.A., (2008). Clathrate Hydrates of Natural Gases. CRC Press, ISBN: 9780849390784 - Thakur, N.K., Rajput, S. (2011). Exploration of Gas Hydrates: Geophysical Techniques. Springer, New York. |

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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 to Gas Hydrates | Lecture, discussion, sampling. |
| 2 | Chemical Structure of Gas Hydrates | Lecture, discussion, sampling. |
| 3 | Gas Hydrate Areas | Lecture, discussion, sampling. |
| 4 | Gas Hydrate Stability Conditions in Nature | Lecture, discussion, sampling. |
| 5 | Well Log Analysis for Gas Hydrates | Lecture, discussion, sampling. |
| 6 | Drilling of Gas Hydrate Reservoirs | Lecture, discussion, sampling. |
| 7 | Well Completion Techniques for Gas Hydrate Reservoirs | Lecture, discussion, sampling. |
| 8 | Coring Operations for Gas Hydrate Resevoirs | Lecture, discussion, sampling. |
| 9 | Geochemical Analysis of Gas Hydrate Reservoirs | Lecture, discussion, sampling. |
| 10 | Gas Production from Gas Hydrate Reservoirs | Lecture, discussion, sampling. |
| 11 | Importance of Geomechanics in Gas Hydrate Reservoirs | Lecture, discussion, sampling. |
| 12 | Gas Production Trials in Gas Hydrate Reservoirs in Permafrosts | Lecture, discussion, sampling. |
| 13 | Gas Production Trials in Gas Hydrate Reservoirs in Marine Sediments | Lecture, discussion, sampling. |
| 14.  | Future of Gas Hydrates as an Energy Resource | Lecture, discussion, sampling. |
| 15 | Final  | Written exam |

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| **Program Outcomes** | 01 | 02 | 03 | 04 |
| PO 01  | To be able to classify gas hydrate type in nature | 5 | 4 | 4 | 5 |
| PO 02 | To estimate gas in place in gas hydrates | 4 | 5 | 5 | 4 |
| PO 03 | To predict gas hydrate stability conditions | 5 | 4 | 4 | 5 |
| PO 04 | To choose appropriate gas production for gas hydrate reservoirs | 5 | 5 | 5 | 5 |
| PO 05 | To choose appropriate design parameters for drilling in gas hydrate reservoirs | 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 |