**ESOGU MECHANICAL ENGINEERING DEPARTMENT**

**COURSE INFORMATION FORM**

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| **Course Name** | **Course Code** |
| NATURAL GAS SYSTEMS | 151817442 |

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| **Semester** | **Number of Course Hours per Week** | **ECTS** |
| **Theory** | **Practice** |
| 7 | 3 | 0 | 5 |

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| **Course Category (Credit)** |
| **Basic Sciences** | **Engineering Sciences** | **Design** | **General Education** | **Social** |
|  | X |  |  |  |

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| **Course Language** | **Course Level** | **Course Type** |
| Turkish | Undergraduate | Elective |

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| **Prerequisite(s) if any** |  |
| **Objectives of the Course** | The aim of the course is to provide the student with the skills to knowledge, interpret and design various natural gas systems, to knowledge the outdoor natural gas distribution network, internal installation sections, general safety rules and to design internal installations. |
| **Short Course Content** | Properties of natural gas, combustion equations, lower and upper calorific value calculations, combustion air, combustion products calculation. Knowledge of outdoor natural gas distribution network, filtering and pressure reducing stations. Knowledge of natural gas-powered devices and their general features and obtaining information about safety rules. Chimneys and their features. Natural gas meters, types, features. Domestic regulators. Natural gas internal column installation project preparation rules and calculations. |

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| **Learning Outcomes of the Course** | **Contributed PO(s)**  | **Teaching Methods \*** | **Measuring Methods \*\*** |
| **1** | Knows the formation and properties of natural gas. | 1,6,11 | 1,5 | K |
| **2** | Knows the rules of natural gas underground and aboveground facilities, recognizes the pipes used, and knows the methods of protection against corrosion. | 1,6,11 | 1,5 | K |
| **3** | Recognizes natural gas burning devices and classifies chimneys. | 1,6,11 | 1,5 | K |
| **4** | Recognizes the meters used in natural gas installations and knows the installation conditions. | 1,6,11 | 1,5 | K |
| **5** | Knows the indoor column installation rules and makes calculations and installation drawings. | 1,3,4,6,7 | 1,10,11,15 | D,E,K |
| **6** | Knows the installation rules of boiler rooms using natural gas, and makes boiler room ventilation calculations and projects. | 1,3,4,6,7 | 1,10,11,15 | E,G,J,K |
| **7** |  |  |  |  |
| **8** |  |  |  |  |

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| **Main Textbook** | - Karakoç, H., (2006) “Doğalgaz Tesisatı”, Demir Döküm Teknik Yayınları- TS 7363 Doğal gaz –bina iç tesisatı projelendirme ve uygulama kuralları |
| **Supporting References** | - Zetacad yazılımı |
| **Necessary Course Material** | Computer, projector. |

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| **Course Schedule** |
| **1** | Properties of natural gas. |
| **2** | Combustion equations, lower and upper thermal value calculations. |
| **3** | Combustion air, combustion products account. |
| **4** | Natural gas pressure reducing stations, transmission lines |
| **5** | Natural gas installation underground and above ground installation rules, pipes, their properties and protection. |
| **6** | Natural gas burning devices, their features. |
| **7** | Natural gas meters, facility conditions |
| **8** | Mid-Term Exam |
| **9** | Chimneys, features, classification |
| **10** | Natural gas domestic installation rules |
| **11** | Natural gas column installation calculation and project design |
| **12** | Natural gas internal installation calculation |
| **13** | Boiler room natural gas installation rules |
| **14** | Boiler room ventilation calculations |
| **15** | Boiler room installation calculation and project planning |
| **16,17** | Final Exam |

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| **Calculation of Course Workload** |
| **Activities** | **Number** | **Time (Hour)** | **Total Workload (Hour)** |
| Course Time (number of course hours per week) | 14 | 3 | 42 |
| Classroom Studying Time (review, reinforcing, prestudy,….) | 14 | 1 | 14 |
| Homework | 1 | 20 | 20 |
| Quiz Exam |  |  |  |
| Studying for Quiz Exam |  |  |  |
| Oral exam  |  |  |  |
| Studying for Oral Exam  |  |  |  |
| Report (Preparation and presentation time included) | 2 | 20 | 40 |
| Project (Preparation and presentation time included) | 1 | 22 | 22 |
| Presentation (Preparation time included) |  |  |  |
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| Mid-Term Exam |  |  |  |
| Studying for Mid-Term Exam |  |  |  |
| Final Exam |  |  |  |
| Studying for Final Exam |  |  |  |
|  | **Total workload** | **138** |
|  | **Total workload / 30** | **4.6** |
|  | **Course ECTS Credit** | **5** |

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| **Evaluation** |
| **Activity Type** | **%** |
| Mid-term |  |
| Quiz |  |
| Homework | 50 |
| Bir öğe seçin. |  |
| Project Observation | 50 |
| **Final Exam** |  |
| **Total** | 100 |

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| **RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO)** (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low) |
| **NO** | **PROGRAM OUTCOME** | **Contribution** |
| **1** | Sufficient knowledge of engineering subjects related with mathematics, science and mechanical engineering; an ability to apply theoretical and practical knowledge on solving and modeling of mechanical engineering problems. | 4 |
| **2** | Ability to determine, define, formulate and solve complex mechanical engineering problems; for that purpose an ability to select and use convenient analytical and experimental methods. | 3 |
| **3** | Ability to design a complex system, a component and/or an engineering process under real life constrains or conditions, defined by environmental, economical and political problems; for that purpose an ability to apply modern design methods. | 4 |
| **4** | Ability to develop, select and use modern methods and tools required for mechanical engineering applications; ability to effective use of information technologies.  | 2 |
| **5** | In order to investigate mechanical engineering problems; ability to set up and conduct experiments and ability to analyze and interpretation of experimental results. | 1 |
| **6** | Ability to work effectively in inner or multi-disciplinary teams; proficiency of interdependence. | 3 |
| **7** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | 2 |
| **8** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | 1 |
| **9** | Understanding of professional and ethical issues and taking responsibility.  | 2 |
| **10** | Awareness of project, risk and change management; awareness of entrepreneurship, innovativeness and sustainable development. | 1 |
| **11** | Knowledge of actual problems and effects of engineering applications on health, environment and security in global and social scale; an awareness of juridical results of engineering solutions. | 2 |
| **12** |  |  |

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| **LECTUTER(S)** |
| **Prepared by** | Associate Professor Özge ALTUN |  |  |  |
| **Signature(s)** |  |  |  |  |

**Date:**06.06.2024