**ESOGU MECHANICAL ENGINEERING DEPARTMENT**

**COURSE INFORMATION FORM**

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| **Course Name** | **Course Code** |
| Engineering Materials | 151814246 |

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| **Semester** | **Number of Course Hours per Week** | | **ECTS** |
| **Theory** | **Practice** |
| 4 | 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** |
| English | Undergraduate | Compulsory |

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| **Prerequisite(s) if any** | Materials Science |
| **Objectives of the Course** | Teaching the classification and introduction of engineering materials and methods for improving their properties. |
| **Short Course Content** | Classification of engineering materials, cast irons, steels, material norms, heat treatments, surface hardening methods of steels, diffusion, non-ferrous alloys, material properties, plastics, ceramics, composite materials |

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| **Dersin Öğrenim Çıktıları** | | **Katkı Sağladığı PÇ/PÇ’ler** | **Öğretim Yöntemleri \*** | **Ölçme Yöntemleri \*\*** |
| **1** | Define engineering materials. | 1,2,3,4,5,9,10,11 | 1,5,10,11 | A,B |
| **2** | Interpret engineering materials. | 1,2,3,4,5 | 1,5,10,11 | A,B |
| **3** | Show the place of the given information in practice. | 1,2,3,4,5 | 1,5,10,11 | A,B |
| **4** | Recognize engineering materials, make designs regarding material selection. | 1,2,3,4,5,7,8 | 1,5,10,11 | A,B |
| **5** | Evaluate engineering materials according to working conditions. | 1,2,3,4,5,9,10,11 | 1,5,10,11 | A,B |
| **6** | Material selection of machine parts in construction according to each other. | 1,2,3,4,5,9,10,11 | 1,5,10,11 | A,B |
| **7** | Can evaluate with awareness of monitoring and updating the information in production and technology. | 1,2,3,4,5,9,10,11 | 1,5,10,11 | A,B |
| **8** |  |  |  |  |
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| **Main Textbook** | Materials Science and Engineering: An Introduction, 8th Edition, William D. Callister, David D. Rethwisch, MSE |
| **Supporting References** | Elements of Materials Science and Engineering, Vlack, L.H.V., AddisonWesley Pub.Co., 1995 |
| **Necessary Course Material** | Textbook, Laboratory Equipment, Projector |

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| **Dersin Haftalık Planı** | |
| **1** | Classification of engineering materials |
| **2** | Ferrous materials |
| **3** | Steels and their classification |
| **4** | Cast irons and their classification |
| **5** | Material standards |
| **6** | Heat treatments |
| **7** | Methods for surface hardening of metals |
| **8** | Midterm exams |
| **9** | Non-ferrous alloys |
| **10** | Heat treatments applied to non-ferrous alloys |
| **11** | General material properties |
| **12** | Ceramic materials |
| **13** | Polymer materials |
| **14** | Composite materials |
| **15** | Corrosion, electrical and magnetic properties |
| **16** | Final exams |

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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 | 3 | 42 |
| Homework |  |  |  |
| Quiz Exam |  |  |  |
| Studying for Quiz Exam |  |  |  |
| Oral exam |  |  |  |
| Studying for Oral Exam |  |  |  |
| Report (Preparation and presentation time included) |  |  |  |
| Project (Preparation and presentation time included) |  |  |  |
| Presentation (Preparation time included) |  |  |  |
| Mid-Term Exam | 1 | 2 | 2 |
| Studying for Mid-Term Exam | 1 | 30 | 30 |
| Final Exam | 1 | 2 | 2 |
| Studying for Final Exam | 1 | 2 | 2 |
| Course Time (number of course hours per week) | 1 | 30 | 30 |
|  | **Total workload** | | **150** |
|  | **Total workload / 30** | | **5** |
|  | **Course ECTS Credit** | | **5** |

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

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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** | Adequate knowledge in mathematics, science and Mechanical Engineering; ability to apply theoretical and applied knowledge in these fields to model and solve Mechanical Engineering problems | 5 |
| **2** | Ability to identify, define, formulate and solve complex engineering problems in Mechanical Engineering and related fields by selecting and applying appropriate analysis and modeling methods | 5 |
| **3** | Ability to design a complex system, device or product under realistic constraints and conditions in line with a specified goal, also applying modern design methods. | 5 |
| **4** | Ability to develop, select and use modern techniques and tools required for Mechanical Engineering applications and to effectively utilize information technologies | 3 |
| **5** | Ability to design experiments, conduct experiments, collect data, analyze and interpret results to examine Mechanical Engineering problems | 2 |
| **6** | Ability to work individually, do disciplinary and interdisciplinary teamwork | 3 |
| **7** | Ability to communicate effectively in Turkish verbally and in writing and to use/develop foreign language knowledge | 3 |
| **8** | Awareness of the necessity of lifelong learning; ability to access information, follow developments in science and technology and constantly renew oneself | 3 |
| **9** | Awareness of professional and ethical responsibility | 3 |
| **10** | Information about applications in business life such as project management, risk management and change management; Awareness of entrepreneurship, innovation and sustainable development | 5 |
| **11** | Knowledge of the global and societal impacts of engineering practices on health, environment and safety; awareness of national and international legal regulations and standards and the legal implications of engineering solutions | 4 |

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| **LECTUTER(S)** | | | | |
| **Prepared by** | Dr. Öğr. Üyesi Esad Kaya |  |  |  |
| **Signature(s)** |  |  |  |  |

22/11/2024