**ESOGU MECHANICAL ENGINEERING DEPARTMENT**

**COURSE INFORMATION FORM**

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| **Course Name** | **Course Code** |
| Machine Laboratory I | 151817412 |

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| **Semester** | **Number of Course Hours per Week** | **ECTS** |
| **Theory** | **Practice** |
| 7 | 0 | 4 | 3 |

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| **Course Category (Credit)** |
| **Basic Sciences** | **Engineering Sciences** | **Design** | **General Education** | **Social** |
|  | 2 |  |  |  |

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

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| **Prerequisite(s) if any** | - |
| **Objectives of the Course** | - To learn the geometric control of the machines and measuring instruments that students will use in machining in practice.- General information about engine and engine parts- Fluidized bed and heat transfer applications, general information about heat exchangers- Flow-pressure measurements in hydraulic machinery and installations- Heat treatment of steels and heat effect tests on welded joints  |
| **Short Course Content** | Basic experiments used to determine static and dynamic accuracy of machine tools. Determination of part dimensions and applications of measuring instrumentsGeneral information about engine and engine partsFluidized bed and heat transfer application and general information about heat exchangersFlow-pressure measurements in hydraulic machinery and installationsJominy hardness determination, recrystallization and examination of welded joints  |

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| **Learning Outcomes of the Course** | **Contributed PO(s)**  | **Teaching Methods \*** | **Measuring Methods \*\*** |
| **1** | Understanding the use of test benches and using them in practice  | 1, 4, 5, 6 | 1, 3, 6, 12, 15 | A, E, I, K |
| **2** | Interpreting and analyzing experimental results in Mechanical Engineering  | 1, 2, 3, 7 | 1, 3, 6, 12, 15 | A, E, I, K |
| **3** | Theoretical research and application-oriented experimental design in Mechanical Engineering | 5, 6 | 1, 3, 6, 12, 15 | A, E, I, K |
| **4** | Determining test sample sizes and using measuring instruments in Mechanical Engineering | 4, 5 | 1, 3, 6, 12, 15 | A, E, I, K |

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| **Main Textbook** | Laboratory test sheets |
| **Supporting References** | Mechanical Engineering basic engineering books |
| **Necessary Course Material** | Test installations in laboratories |

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| **Course Schedule** |
| **1** | General information about occupational safety |
| **2** | General information about preparation for experiments and report writing |
| **3** | Static sensitivity test |
| **4** | Venturimeter experiment |
| **5** | Theoretical information about motors |
| **6** | Jominy experiments |
| **7** | Heat conduction coefficient determination experiment |
| **8** | Mid-Term Exam |
| **9** | Dynamic sensitivity experiment |
| **10** | Time-dependent heat conduction |
| **11** | Determination of the center of pressure test - Sluice test |
| **12** | Motor characteristic curves  |
| **13** | Determination of welding and mechanical properties |
| **14** | Natural convection experiment |
| **15** | Heat exchangers |
| **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 | 4 | 56 |
| Classroom Studying Time (review, reinforcing, prestudy,….) | 12 | 1 | 12 |
| Homework |  |  |  |
| Quiz Exam |  |  |  |
| Studying for Quiz Exam |  |  |  |
| Oral exam  |  |  |  |
| Studying for Oral Exam  |  |  |  |
| Report (Preparation and presentation time included) | 12 | 1 | 12 |
| Project (Preparation and presentation time included) |  |  |  |
| Presentation (Preparation time included) |  |  |  |
| Mid-Term Exam | 1 | 2 | 2 |
| Studying for Mid-Term Exam | 1 | 8 | 8 |
| Final Exam | 1 | 2 | 2 |
| Studying for Final Exam | 1 | 8 | 8 |
|  | **Toplam iş yükü** | **100** |
|  | **Toplam iş yükü / 30** | **3,3** |
|  | **Dersin AKTS Kredisi** | **3** |

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| **Evaluation** |
| **Activity Type** | **%** |
| Mid-term | 40 |
| Report | 10-10 |
| **Final Exam**  | 40 |
| **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 to mathematics, science and own branch; an ability to apply theoretical and practical knowledge on solving and modeling of engineering problems. | 4 |
| **2** | Ability to determine, define, formulate and solve complex engineering problems; for that purpose, an ability to select and use convenient analytical and experimental methods. | 5 |
| **3** | Ability to design a complex system, a component and/or an engineering process under real life constraints or conditions, defined by environmental, economic and political problems; for that purpose an ability to apply modern design methods. | 2 |
| **4** | Ability to develop, select and use modern methods and tools required for engineering applications; ability to effectively use information technologies. | 4 |
| **5** | To investigate engineering problems; ability to set up and conduct experiments and ability to analyze and interpret experimental results. | 5 |
| **6** | Ability to work effectively in inner or multi-disciplinary teams; proficiency of interdependence. | 4 |
| **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. | 3 |
| **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. | 3 |

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| **LECTUTER(S)** |
| **Prepared by** | Prof. Dr. Mustafa ULUTAN | Doç. Dr. Özge ALTUN | Doç. Dr. Nihal UĞURLUBİLEK | Doç. Dr. H. Sevil ERGÜR | Dr. Öğr. Üyesi Çisil TİMURALP | Dr. Öğr. Üyesi Zerrin SERT | Dr. Kerem AYBAR |
| **Signature(s)** |  |  |  |  |  |  |  |

**Date:** 17.11.2024