**ESOGU MECHANICAL ENGINEERING DEPARTMENT**

**COURSE INFORMATION FORM**

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| **Course Name** | **Course Code** |
| Machine Laboratory II  | 151818413 |

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| **Semester** | **Number of Course Hours per Week** | **ECTS** |
| **Theory** | **Practice** |
| 8 | 0 | 4 | 3 |

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| **Course Category (Credit)** |
| **Basic Sciences** | **Engineering Sciences** | **Design** | **General Education** | **Social** |
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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** | - Machine tool programming and part design- Regulator measurement and application- Investigation of aerodynamic properties- Tensile test and its application, casting and mold sand tests - Radial pump test and Francis turbine test |
| **Short Course Content** | Programming and part design of the machines that students will use in machiningRegulator measurement and applicationInvestigation and interpretation of aerodynamic propertiesDetermination of stress-shape change and casting testRadial pump test and Franchish turbine test |

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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** | Machine programming and part design |
| **4** | General information about aerodynamic properties |
| **5** | Regulator |
| **6** | Cooling  |
| **7** | Jominy hardness test  |
| **8** | Mid-Term Exam |
| **9** | Radial pump test  |
| **10** | Part program and manufacturing |
| **11** | Heat transfer on expanded surfaces |
| **12** | Constant moment characteristic test |
| **13** | Casting  |
| **14** | Cross-flow heat exchanger |
| **15** | Francis turbine experiment |
| **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