**ESOGU MECHANICAL ENGINEERING DEPARTMENT**

**COURSE INFORMATION FORM**

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| **Course Name** | **Course Code** |
| Measurement Technique | **151814555** |

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

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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 | Compulsory |

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| **Prerequisite(s) if any** | - |
| **Objectives of the Course** | Learn measurement techniques and their applications in mechanical engineering, gain the ability to evaluate measurement data. |
| **Short Course Content** | General principles of measurement techniques, SI units, Analysis of measurement results, Dimension measurement, ISO tolerances, Control gauges, Strain gauges, Hardness measurement, Force and torque measurement, Surface roughness measurement and Gear measurement, Vibration and noise measurement, Temperature measurement, Pressure measurement, Flow measurement |

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| **Learning Outcomes of the Course** | | **Contributed PO(s)** | **Teaching Methods \*** | **Measuring Methods \*\*** |
| **1** | Understands the importance of experimental work in engineering. | 1, 2, 5, 6 | 1, 5, 6, 11, 12 | A |
| **2** | Recognizes basic measurement devices related to engineering subjects | 1, 3 | 1, 5, 6, 11, 12 | A |
| **3** | Learns the working principles of different measuring devices and measuring systems. | 1, 3 | 1, 5, 6, 11, 12 | A |
| **4** | To have knowledge about metrology and standards and to be able to select devices and systems for accurate measurement in line with this knowledge. | 1, 8, 11 | 1, 5, 6, 11, 12 | A |
| **5** | Gains the ability to analyze and evaluate measurement results. | 1, 2, 5, 9 | 1, 5, 6, 11, 12 | A |

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| **Main Textbook** | Ölçme Tekniği, Tezcan Şekercioğlu, Birsen Yayınevi, 2024 |
| **Supporting References** | Ölçme Tekniği, Osman F. Genceli, Birsen Yayınevi, 2015  Mechanical Measurement, R.S. Figliola and D.E. Beasley, Wiley, 2011 |
| **Necessary Course Material** | - |

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| **Course Schedule** | |
| **1** | General principles of measurement techniques |
| **2** | SI units |
| **3** | Analysis of measurement results |
| **4** | Dimension measurement |
| **5** | ISO tolerances |
| **6** | Control gauges |
| **7** | Strain gauges |
| **8** | Mid-Term Exam |
| **9** | Hardness measurement |
| **10** | Force and torque measurement |
| **11** | Surface roughness measurement and Gear measurement |
| **12** | Vibration and noise measurement |
| **13** | Temperature measurement |
| **14** | Pressure measurement |
| **15** | Flow measurement |
| **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 | 2 | 28 |
| Homework | 0 | 0 | 0 |
| Quiz Exam | 0 | 0 | 0 |
| Studying for Quiz Exam | 0 | 0 | 0 |
| Oral exam | 0 | 0 | 0 |
| Studying for Oral Exam | 0 | 0 | 0 |
| Report (Preparation and presentation time included) | 0 | 0 | 0 |
| Project (Preparation and presentation time included) | 0 | 0 | 0 |
| Presentation (Preparation time included) | 0 | 0 | 0 |
| Mid-Term Exam | 1 | 2 | 2 |
| Studying for Mid-Term Exam | 1 | 15 | 15 |
| Final Exam | 1 | 2 | 2 |
| Studying for Final Exam | 1 | 20 | 20 |
|  | **Total workload** | | **109** |
|  | **Total workload / 30** | | **3,6333** |
|  | **Course ECTS Credit** | | **4** |

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| **Evaluation** | |
| **Activity Type** | **%** |
| Mid-term | 50 |
| **Final Exam** | 50 |
| **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 | 2 |
| **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 | 1 |
| **4** | Ability to develop, select and use modern methods and tools required for Mechanical engineering applications; ability to effective use of information technologies | 5 |
| **5** | In order to investigate Mechanical engineering problems; ability to set up and conduct experiments and ability to analyze and interpretation of experimental results. | 5 |
| **6** | Ability to work effectively in inner or multi-disciplinary teams; proficiency of interdependence  effectively in inner or multi-disciplinary teams; proficiency of | 4 |
| **7** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language | 1 |
| **8** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | 4 |
| **9** | Understanding of professional and ethical issues and taking responsibility | 3 |
| **10** | Awareness of project, risk and change management; awareness of entrepreneurship, innovativeness and sustainable development. | 3 |
| **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. | 5 |

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| **Prepared by** | Assoc. Prof. Dr. Ümit ER | Asst. Prof. Dr. Çisil TİMURALP |
| **Signature(s)** |  |  |

**Date:**06.06.2024