**ESOGU AERONAUTICAL ENGINEERING DEPARTMENT**

**COURSE INFORMATION FORM**

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| **Course Name** | **Course Code** |
| **MANUFACTURING TECHNOLOGIES** | **1524xxx** |

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| **Semester** | **Number of Course Hours per Week** | **ECTS** |
| **Theory** | **Practice** |
| 5 | 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 | Elective |

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| **Prerequisite(s) if any** | - |
| **Objectives of the Course** | The objective of this course is to teach students the descriptions of manufacturing processes. Students are to learn to identify the processes and to perform simple calculations like machining time in metal removal processes, etc. |
| **Short Course Content** | Introduction. Casting. Powder metallurgy. Metal working; hot working and cold working processes. Chip removal processes. Non-traditional machining processes. Welding. Additive manufacturing. |

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| **Learning Outcomes of the Course** | **Contributed PO(s)**  | **Teaching Methods \*** | **Measuring Methods \*\*** |
| **1** | Understanding of manufacturing methods in aerospace industry | 1, 2 | 1, 11 | A |
| **2** | Understanding the selection of a manufacturing processes for a specific application | 2, 3 | 1, 11 | A |
| **3** | Developing a manufacturing process of aerostructures | 3, 4 | 1, 11 | A |
| **4** | Developing professional skills to solve technical problems | 5, 6 | 1, 11 | A |
| **5** |  |  |  |  |
| **6** |  |  |  |  |
| **7** |  |  |  |  |
| **8** |  |  |  |  |

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| **Main Textbook** | E. P. DeGarmo, J. T. Black and R. A. Kohser, Materials and Processes in Manufacturing, MacMillan. |
| **Supporting References** | S. Kalpakjian, Manufacturing Processes for Engineering Materials, Addison Wesley. |
| **Necessary Course Material** | - |

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| **Course Schedule** |
| **1** | Introduction |
| **2** | Casting |
| **3** | Powder metallurgy |
| **4** | Metal working: general description |
| **5** | Hot working processes  |
| **6** | Cold working processes |
| **7** | Chip removal; general description, drilling and reaming |
| **8** | Mid-Term Exam |
| **9** | Turning and related operations, milling, broaching |
| **10** | Turning and related operations, milling, broaching |
| **11** | Gear cutting, abrasive machining |
| **12** | Non-traditional machining processes |
| **13** | Non-traditional machining processes |
| **14** | Welding |
| **15** | Additive Manufacturing  |
| **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,….) | 2 | 4 | 8 |
| 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 | 3 | 3 |
| Studying for Mid-Term Exam | 1 | 40 | 40 |
| Final Exam | 1 | 3 | 3 |
| Studying for Final Exam | 1 | 40 | 40 |
|  | **Total workload** | **136** |
|  | **Total workload / 30** | **4.5** |
|  | **Course ECTS Credit** | **5** |

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| **Evaluation** |
| **Activity Type** | **%** |
| Mid-term | 40 |
| Quiz |  |
| Homework |  |
| Bir öğe seçin. |  |
| Bir öğe seçin. |  |
| **Final Exam** | 60 |
| **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 own branch; an ability to apply theoretical and practical knowledge on solving and modeling of engineering problems. | 5 |
| **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. | 4 |
| **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. | 3 |
| **4** | Ability to develop, select and use modern methods and tools required for engineering applications; ability to effective use of information technologies. | 3 |
| **5** | In order to investigate engineering problems; ability to set up and conduct experiments and ability to analyze and interpretation of experimental results. | 4 |
| **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. |  |
| **8** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. |  |
| **9** | Understanding of professional and ethical issues and taking responsibility  |  |
| **10** | Awareness of project, risk and change management; awareness of entrepreneurship, innovativeness and sustainable development. |  |
| **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. |  |
| **12** |  |  |

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| **LECTUTER(S)** |
| **Prepared by** | Assoc. Prof. Selim Gürgen |  |  |  |
| **Signature(s)** |  |  |  |  |

**Date:**06.06.2024