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| **MENG364 – Manufacturing Technology** | | | | | | |
| **Eastern Mediterranean University**  **Faculty of Engineering** | | | | | | |
| **Department:**MechanicalEngineering | | | | | | |
| **ProgramCode:** 23 | | **Program:** Mechanical Engineering | **Year/Semester:**2020-2021FALL | | | |
| **Course Code:**  MENG364 | | **Course Title:**  Manufacturing Technology | **Credit hours** | | | |
| **Lec.** | **Tut/Lab** | | **Total** |
| **4** | **1** | | **4** |
| **Categorization of Course:**  Engineering or Area Core  Engineering Course offered by other programs  Engineering Area Elective  Mathematics and Basic Sciences  General Education | | | **Categorization of Credits:**   1. Mathematics & Basic Science: - 2. **Engineering Topics: 4** 3. General Education: - 4. Major Engineering Design: - | | | |
| **Instructor Name:** Asst. Prof. Dr. Mohammed Asmael | | | **Office no:**ME122 | | **Office Tel:**6301279 | |
| **Course Web Page:**<https://staff.emu.edu.tr/mohammedasmael/en> | | | | | | |
| **Textbook(s):** Groover, M.P. (2013). Fundamentals of Modern Manufacturing: Materials, Processes And Systems, 5th edition, John Wiley & Sons Inc..  **Indicative Basic Reading List:** Manufacturing Technology Lecture Notes, V. Marinov, (2000) | | | | | | |
| **Catalog Description:** Fundamentals and principles of major manufacturing processes: casting, bulk deformation, sheet metalworking, powder Metallurgy. Processing of polymers, ceramics, glass, rubber and composites. Metal cutting: cutting conditions, forces, temperatures, tool life, surface finish, coolants. Cutting tool materials. Principles, tools and process capabilities of basic machining operations: turning, milling, drilling, planning, shaping, boring, broaching. Gear manufacturing. Abrasive operations: grinding, finishing operations. Non-traditional processes. Basics of joining and assembling. Fusion and solid-state welding. Essentials of computer numerical control | | | | | | |
| **Prerequisite(s)** | MENG201 and MENG286 | | | | | |
| **Type of Course** | Required  Selected Elective Elective | | | | | |

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| **Student Outcomes** | |  |
| **1** | an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, andmathematics |  |
| **2** | an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety,and welfare, as well as global, cultural, social, environmental, and economic factors |  |
| **3** | an ability to communicate effectively with a range of audiences |  |
| **4** | an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, whichmust consider the impact of engineering solutions in global, economic, environmental, and societal contexts |  |
| **5** | an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusiveenvironment, establish goals, plan tasks, and meet objectives |  |
| **6** | an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment todraw conclusions |  |
| **7** | an ability to acquire and apply new knowledge as needed, using appropriate learning strategies. |  |

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| **Course Learning Outcomes** | | **Student Outcomes** | | | | | | | **Assessments and**  **Percentages** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| **1** | Classification of manufacturing | Χ |  |  |  |  |  |  | Online midterm Exams 30%  Online Final Exam 40%  \* Labs Report and Project are group submissions, 30% |
| **2** | Casting technology | Χ |  |  |  | X | X |  |
| **3** | Metal forming and sheet metal working | Χ |  |  |  |  |  |  |
| **4** | Materials removal and machining processes | X |  |  |  |  |  |  |
| **5** | Non-traditional machining processes | Χ |  |  |  |  |  |  |
| **6** | Fundamental of Welding Technology | X |  |  |  |  |  |  |
| **7** | Processing of polymers | X |  |  |  |  |  |  |
| **8** | Introduction to CNC technology and G Codes | Χ |  |  |  | X | X |  |
| **9** | Particulate processing of metals and ceramics | X |  |  |  |  |  |  |
| **10** | Glass working | X |  |  |  |  |  |  |
|  | **Weight of Student Outcomes** | **H** |  |  |  | **L** | **L** |  |  |

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| **Topics Covered and Class Schedule:** | |
| **Week 1** | Introduction to Manufacturing. |
| **Week 2** | Materials and classification of materials |
| **Week 3** | Metal Casting |
| **Week 4** | Metal Casting Processes |
| **Week 5** | Shaping processes for polymers, polymer matrix composites, rubber processing |
| **Week 6** | Processing of ceramics, glass working |
| **Week 7** | Powder metallurgy, Powder preparing techniques, compacting, sintering |
| **Week 8** | **Midterm Examination** |
| **Week 9** | **Midterm Examination** |
| **Week 10** | Bulk Forming: Fundamental of metal forming, rolling, extrusion, drawing, forging |
| **Week 11** | Sheet Metal Forming:Bending, Cutting, Deep Drawing, and others |
| **Week 12** | Machining operations and machine tools: Turning, Milling, Drilling, Planing and shaping, Boaring, Broaching and gear manufacturing |
| **Week 13** | Abrasive Processes: Grinding, Lapping, Honning, finishing processes |
| **Week 14** | Joining and assembly processes, Welding, Types of welding processes, Mechanical Assembly |
| **Week 15** | **Revision** |
| **Week 16** | **Final Examination** |

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| **Laboratory Experiments** | | | | |
| **No.** | **Experiment Title and Equipment Used** | **CLO** | **SO** | **Percentage** |
| **1** | **Title:** G-code Programming with CNC technology  **Equipment:**CNC Machine Center | **8** | **5, 6** | 10% |
| **2** | **Title:** Metal Casting  **Equipment:**Manufacturing Lab | **2** | **5, 6** | 20% |

**Important Notes Regarding the Course:** University rules and regulations are applied to this course. For details, please see <http://mevzuat.emu.edu.tr>

**Exam and Quiz Policy:**

The midterm and final exams are OPEN book in Case of Online Teaching.

**Makeups:**

1. There is no make-up or resit for the Quiz and Labs.
2. A student who fails to sit for an examination for a valid reason is given a make-up exam. Within three working days after the examination, students who wish to take a make-up must submit a **written statement** to the course instructor explaining the reason(s) for his/her request.
3. Eligibility to take a **Make-Up Exam**:
   1. Student must contact the Instructor immediately within “**three working days**” after the examination when (s)he has missed the mid-term exam or final exam and to discuss with the faculty about the date and time to take the make-up exam.
   2. Student must secure a “**Make-Up Exam Form**” from the department Office or from instructor website & fill-out the Form. For each Make-Up Exam, please use separate Form.
   3. Student must secure the approval from the instructor for taking the Make-Up Exam.
   4. Failure to take the Make-Up Exam at the agreed date and time will lead to a “NG” Grade for the Make-Up Exam, midterm or final.

**NG Policy:**

1. **“NG” Nil Grade/ Failing from Absenteeism:** Students who do not comply with the required level attendance and/or not fulfilling the requirements for the evaluation of the course are given the “NG” grade by the Instructor of the Course based on the criteria determined by the Faculty/School Academic Council. Students are informed about the criteria for receiving the “NG” grade by the related course instructor at the beginning of the semester. “NG” grade is included in the computation of GPA and CGPA.
2. Student attendance is monitored and assessed by the course instructor. A student who fails to meet the requirements of a course or who is absent more than the limit specified by the Faculty is considered to be unsuccessful in that course.
3. Students who do not attend any of the above assessment activities (such as mid-term exam, final exam, lab exam, design project report etc.) will be given NG (Nil Grade).
4. Late Submissions of the Assignments, Lab Reports and Project will be graded as zero.

**Appeals:**

Any appeal against the marks of any assessment component must be made to the course instructor within one week following the announcement of the marks. Any appeal concerning a semester grade must be made to the course instructor no later than the end of the registration period of the following semester.