**EASTERN MEDITERRANEAN UNIVERSITY**

**Faculty of Engineering**

**Department of INDUSTRIAL ENGINEERING**

**COURSE OUTLINE**

**SPRING 2024-2025**

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|  **COURSE CODE** | IENG492 / MANE492 |  **COURSE LEVEL** |  4th Year |
|  **COURSE TITLE** | Manufacturing and Service Systems Design Project |
|  **COURSE TYPE** | Area Core |
|  **LECTURER(S)** | Prof. Dr. Orhan KORHAN & Asst. Prof. Dr. Oğuzhan KIRILMAZ |
|  **CREDIT VALUE** | (3,0,1) 3 |  **ECTS VALUE** |  9 |
|  **PREREQUISITES** | IENG490 / MANE490, graduate semester standing  |
|  **CO-REQUISITE** | IENG441 / MANE441, submission of IENG410 / MANE400 report |
|  **WEB LINK** | <https://lms.emu.edu.tr/>  |
|  **rESEARCH Assistants** | Will be announced later |
| **TimETable** | Thursday 14:30-16:20 (Meetings, IED-203); Tuesday 16:30-18:20 (Lab.s, PC LAB1)  |
| **TEXTBOOK** | This course has no special textbook. The students are referred to the EMU Library which has quite a good collection of books on the intermediate and advanced levels in the related fields of industrial/management engineering discipline EMU Library can be searched at: <https://library.emu.edu.tr/en>  |
| **CATALOGUE DESCRIPTION** | The course consists of a design study of a complex manufacturing or service system. The study includes computer integrated modeling based on multiple realistic constraints such as demand, materials, capacity, location, man-machine, and information requirements. It is a project-oriented course that is basically a synthesis of the techniques and methodologies previously covered in other courses. Projects are implemented conforming relevant standards (including product, process standards and safety regulations), ethical and environmental policies.  |
| **COURSE OBJECTIVES (CO)**  | 1. To design the structure of a company fitted to the activity of the company in an economic way. (Contributing Student Outcomes 2, 4, 7)
2. Analyzing a market (size, competitors, product types, etc.) and determining market share. (Contributing Student Outcomes 1, 2, 6, 7)
3. To describe and select products. (Contributing Student Outcomes 2, 7)
4. To understand, describe and select technology. (Contributing Student Outcomes 2, 7)
5. Capacity planning. (Contributing Student Outcomes 1, 2, 6, 7)
6. To select production processes to a finished product. (Contributing Std. Out.s 2, 4, 7)
7. To select machinery and equipment in an economic way. (Contributing Student Outcomes 1, 2, 4, 6, 7)
8. To select location for a facility. (Contributing Student Outcomes 1, 2, 6, 7)
9. To design a material handling system. (Contributing Student Outcomes 2, 4, 7)
10. To organize waste management and other environmental behavior for a company. (Contributing Student Outcomes 2, 7)
11. Designing the necessary personnel. (Contributing Student Outcomes 2, 7)
12. Designing facility layout according to the needs. (Contrib. Std. Outcomes 1, 2, 4, 6, 7)
13. To estimate the energy and water demand of a company. (Contributing Student Outcomes 2, 7)
14. To organize quality management system. (Contributing Student Outcomes 2, 7)
15. To design the information system of a (small) company (Contributing Student Outcomes 2, 7)
16. To select and apply industrial standards concerning to the product and production system of a company. (Contributing Student Outcomes 2, 7)
17. To apply Master Production Schedule (MPS) and Material Requirement Planning (MRP). (Contributing Student Outcomes 1, 2, 6, 7)
18. To design a good inventory management system. (Contributing Std. Outcomes 2, 4, 7)
19. To apply project management in the establishment and/or running of a company. (Contributing Student Outcomes 2, 7)
20. To prepare of a financial analysis of a company including its profitability and to apply the results in the feasibility study of establishing the company. (Contributing Student Outcomes 1, 2, 4, 6, 7)
21. Preparing a Term Project (Working effectively in multidisciplinary teams, making an independent research, applying related techniques in real life environment, and writing and presenting a technical report on the results) (Contributing Student Outcomes 2, 3, 4, 5, 7)
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| **GENERAL LEARNING OUTCOMES (COMPETENCES)** | On successful completion of this course, students are expected to develop **knowledge** and **understanding** of:* Applying fundamental concepts, techniques, and methodologies of IE/ME to design a complex industrial or service system
* The importance of familiarity with recent issues as related to practice of Industrial Engineering/Management Engineering
* The relationships between various problems of different fields of IE/ME
* Developing the ability to think critically
* Importance of conducting an independent research and integration of the findings through a proper project teamwork by demonstrating involvement in and support for team activities
* Importance of effective communication with team members, faculty, and professionals in the field
* Simulating and predicting the behavior of system design alternatives under various valid conditions
* The importance of standards in engineering and design

On successful completion of this course, students are expected to develop **their skills in**:* The synthesis of the techniques and methodologies of IE/ME
* Working in a project team with faculty advising
* Achieving common goals through proper teamwork and bearing the consequences of personal choices
* Extracting relevant information from available sources (incl. all forms of information technology, library searching, professionals etc.) related to the project
* Using engineering standards in design
* Considering realistic constraints that influence design
* Performing feasibility studies and financial analysis of a real-world project
* Using IE/ME software for decision making
* Generating and assessment of alternative plans
* Effective communication of team members to accomplish project activities
* The ability to design, deliver and defend a group presentation of completed project and sell their solutions to management
* Submitting periodic complete, well-organized quality project reports

On successful completion of this course, students are expected to develop their appreciation of and respect for **values and attitudes** regarding the issues of:* Understanding of professional behaviors, engineering, and professional ethics
* Sharing the responsibilities and recognition of the need for and an ability to engage in life-long learning
* Role of IE/ME practices in solving real world problems
* Understanding and incorporating human behavior, capabilities and well being in designing safe work system environment
* Importance of environmental sensitivity and human factors in assessment of alternative designs
* Understanding of global, environmental, and social impacts of engineering solutions
* Importance of adhering to work schedules in real world
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| **GRADING CRITERIA** | Although the student’s overall grade will be based on the general assessment of the course coordinators, the following percentages may give an idea about the relative importance of various assessment tools. The course coordinators reserve the right to modify these percentages in case they deem it necessary.

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| **Assessment Item** | **Weight (%)** |
| Lab/software applications/exams | 15 |
| Participation in Group Meetings | 15 |
| Progress Report  | 15 |
| Final Report | 30 |
| Presentation | 25 |

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| **DISCUSSION MEETINGS (Contact Hours)**  | There will be weekly group-advisor meetings at scheduled time slots for each group. Students are encouraged to ask questions of clarification during scheduled discussion meetings. It will be beneficial for the team to obtain feedback and advice from their advisors. Teams must present their weekly work during these discussion meetings Students may prefer to show and discuss their work on the computer. No show in the meetings will have negative effect on the final grade. Good discussions and active participation may result in bonus points! Mobile phones must be switched off before entering the meetings. |
| **Software Packages** | Each student is expected to have a background in IE/ME/OR related software packages, and use these available packages in the IE Computer Laboratories: LINDO, LINGO, GINO, STORM, QS, XCELL+, ARENA, SPSS, BESTFIT, MATLAB, MAPLE, ACCESS, etc., some technical drawing packages AUTOCAD, VISIO, Google Sketch etc., general documentation and presentation packages MSWord, Excel, Power Point. |
| **Laboratory Work** | Throughout the semester, there will be several laboratory sessions, which will be conducted by the assistants, to do various computer exercises that require the use of IE/OR software available in the laboratory. Laboratory sessions will always be held in the Department’s PC Labs and their dates announced in advance. If you have any problem in these sessions please try to resolve your problem with the assistants first.  |
| **Announcements** | Announcements will be made from <https://lms.emu.edu.tr/>. |
| **Academic Integrity** | *Every student at EMU should behave according to universally accepted norms of behavior and ethics. If a student participates in unlawful unacceptable activities such as listed below, his/her case will be sent to the University Students Disciplinary Committee and will be treated according to the university by-laws and procedures. Depending on the seriousness of the case, it can lead to a requirement to undertake additional work, failure in the course or in a part of it, suspension from the University or even permanent expulsion from the University:** *collusion (material copied from another project team’s report with that team’s knowledge),*
* *purloining (material copied from another project team’s report or work without that team’s knowledge),*
* *ghost writing (project team’s report written by third party and presented by a team as their own),*
* *verbatim copying (material copied word for word or exactly duplicated without any acknowledgement of the source),*
* *inappropriate/inadequate acknowledgement (material copied word for word which is acknowledged as paraphrased but should have been in quotation marks, or material paraphrased without appropriate acknowledgements of its source),*
* *getting someone else to take the examinations for a student,*
* *misrepresentation of student’s exam answer sheet as another’s work,*
* *any form of cheating and knowingly assisting other students to cheat in the exams,*
* *abusing the tolerance or breaking the discipline of the class, etc.,*

*The teams should sign the following statement before submitting their reports:****“We declare that, except where we have indicated, the work we are submitting in this report is our own work.”****Note. Before submitting any report, Turnitin similarity check report must also be provided.* |
| **NG (Nil - grade)** | **Conditions that may lead to NG (Nil-grade):**1. Not submitting the Progress Report or the Final Report.
2. Not attending the Project Presentation.
3. Having an attendance to discussion meetings less than 75%.
4. Having an attendance to lab sessions less than 75%.
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| **Objections** | Objections to any grade must be made to the course coordinator within a week following the announcement of the grades.  |
| **Office Hours** | If students have difficulty in understanding any topic, they should consult their assistants and instructors during their office hours. However, if they wish to meet them outside of their office hours, please ask appointment earlier. |
| **Important Dates**  | **Activity**  **Date** Progress Report Submission Deadline April 29, 2025 (Chapters 1-15)Final Report Submission Deadline June 03, 2025 Presentation Date \* June 10, 2025\* Presentation schedule will be announced later |
| **Important Notes** | 1. Students cannot Withdraw from this course
2. There is no Resit exam for this course
3. There is no Graduation Make-up exam for this course
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**Contribution of course to meeting the requirements of ABET Criterion 5**:

Mathematics & Basic Sciences : 0

Engineering Topic : 3 (contains significant design)

Other : 0

**RELATIONSHIP OF THE COURSE TO STUDENT OUTCOMES**

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| **Student Outcomes** | **Level of Contribution** |
| **No** | **Moderate** | **High** |
| (1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics | o | o | þ |
| (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 | o | o | þ |
| (3) an ability to communicate effectively with a range of audiences | o | o | þ |
| (4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts | o | o | þ |
| (5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives | o | o | þ |
| (6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions | o | o | þ |
| (7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies | o | o | þ |