EASTERN MEDITERRANEAN UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
IENG/MANE112 Introduction to Industrial/Management Engineering
COURSE OUTLINE

COURSE CODE	IENG112 /MANE112	**COURSE LEVEL**	First Year
COURSE TITLE	Introduction to Industrial/Management Engineering	**COURSE TYPE**	Area Core
CREDIT VALUE	(4, 2, 0) 4	**ECTS Credit Value**	8
PRE-REQUISITE(S)	No	**CO-REQUISITE(S)**	No
PREPARED BY	Ramtin Nazerian	**SEMESTER / ACADEMIC YEAR**	Spring 2020-21

	Name(s)	**E-mail**	**Office**	**Telephone**
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ASSISTANT(S)	Elnaz Gholipour; Davood Forghani; Farzad Zaare	-	-	-
COURSE SCHEDULE	Tuesday 14:30-16:20 (IE-D001); Thursday 14:30-15:20 (IE-D001); Tutorial: Thursday 15:30-16:20 (IE-D001), Lab: Tuesday 16:30-18:20 (room: Lab1 and Lab2) Changes are still possible.			
COURSE WEB LINK	TBA			

COURSE DESCRIPTION

This course is designed to introduce the fundamental concepts of Industrial Engineering and give answers to the first questions that are usually asked by the prospective Industrial Engineering students. The course surveys both the traditional and modern topics of Industrial Engineering, providing a historical as well as an academic perspective of the whole profession. Related software applications, together with fundamentals of modeling & optimization, and production system design and control (methods engineering, work measurement, ergonomics, facilities planning and design, production planning, inventory control and quality control) will also be covered in the course.

COURSE OBJECTIVES

The main objectives of this course are:

1. The notion of Technology (Contributing Student Outcomes 1, 7).
2. Mathematical formulation of the Transportation Problem (Contributing Student Outcomes 1, 4).
3. The use of the Transportation Problem for Facility Location decisions (Contributing Student Outcomes 1, 4).
4. Basic calculation of Loan Installments and Revenue of Investments (Contributing Student Outcomes 2, 6).
5. The notion of System (Contributing Student Outcomes 1, 7).
6. Forecast method (Exponential smoothing, moving average, and linear regression) (Contributing Student Outcomes 2, 6).
7. Traveling Salesman Problem and its applications (Contributing Student Outcomes 1, 4, 6).
8. Scheduling on a single machine (Contributing Student Outcome 1).
9. Calculation of standard time (Contributing Student Outcomes 2, 4).
10. MPS (Master production scheduling) (Contributing Student Outcomes 1).
11. MRP (Material requirement planning) (Contributing Student Outcomes 1).
12. Basic Quality control (mean, variance, standard deviation, etc.) (Contributing Student Outcomes 2, 6).
13. Transportation modes (road, rail, air, water, river, tube, etc.) (Contributing Student Outcome 2).
14. Accounting actions (Contributing Student Outcomes 6).
15. Using Excel to solve problems (Contributing Student Outcomes 1, 6).

COURSE LEARNING OUTCOMES

On successful completion of this course, students are expected to develop **knowledge** and **understanding** of:

1. Classification of location problems, and their definitions
2. Formulation of location problems; their objectives, constraints and applicable solution techniques
3. Alternative distance metrics and their use
4. Demand forecasting and market analysis
5. Facilities design in terms of product, process and schedule design
6. Facilities requirements planning in terms of man, machine and material requirements
7. Flow, space and activity relationship planning and departmentalization
8. Material handling systems design
9. Warehouse design
10. Personal requirements and plant support services
11. Alternative layout types
12. Available layout procedures and computerized solution techniques

On successful completion of this course, students are expected to develop **their skills** in:

13. Solving basic facilities location problems
14. Formulating advanced facilities location problems
15. Using MS Excel in numerical problem solving
16. Surveying, gathering and analysis of data for planning purposes
17. Solving plant layout problems

18. Generating layout alternatives using computer software (i.e. BLOCKPLAN)
19. Evaluation of alternative facilities plans

Both written and oral presentation of the project study

On successful completion of this course, students are expected to develop their appreciation of and respect for **values and attitudes** regarding the issues of:

21. Role of Industrial Engineering in Facilities Planning and Design
22. Acting in a team for the team's objectives
23. Importance of location problem in real life
24. Necessity for formulating viable alternatives to facilities planning projects
25. Impact of human factors in generating design alternatives
26. Importance of accuracy in estimating market share, demand, relevant costs and all requirements and the sensitivity of results to these values
27. Impact of computer technology in solving Industrial Engineering problems

CONTRIBUTION OF THE COURSE TO MEETING THE REQUIREMENTS OF CRITERION 5

Mathematics and Basic Sciences : 0
Engineering Topics : 4
General Education : 0

RELATIONSHIP OF THE COURSE TO STUDENT OUTCOMES

	Level of Contribution		
Student Outcomes	**No**	**Moderate**	**High**
(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	☐	☐	☑
(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, which must 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 inclusive environment, establish goals, plan tasks, and meet objectives	☑	☐	☐
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	☐	☐	☑
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	☑	☐	☐

GRADING CRITERIA

Exams: All examinations are based on lectures, tutorials, labs, and assignments. To pass these exams students will need to have studied the material well in advance in order to understand the concepts, procedures and techniques. Quizzes, midterm and final consist of both essay questions and problems. Resit exam consists of essay questions. Exam results will be announced as soon as the exam papers have been evaluated. Descriptions of these examinations are as follows:

Quizzes and class activities: There are three closed-book/closed-notes quizzes that are announced in advance. Required materials are supplied.

Lab Quizzes: There will be two lab quizzes.

Midterm Exam: There will be one closed-book/closed-notes midterm examination that covers all the material up to the date of the examination.

Final Exam: The exam will cover all the material studied throughout the semester.

Make-up Exam: Make-up examination will only be offered to students who missed the **final or midterm exams** and provided adequate documentations for the reason for their absence within three working days at the latest after the examination date. A student's illness will only be accepted as a valid excuse if it is supported by a written report of a physician from the Health Center of the EMU.

Note: The students need a **calculator** so they should bring their calculators to all lecture/tutorial/lab/exam hours.

RELATIONSHIP WITH OTHER COURSES

It is a synthesis course of all the previously taken departmental courses and also a preparation for the graduation project course (IENG492 Manufacturing and Service Systems Design).

LEARNING / TEACHING METHOD

Teaching will be based on enabling the students to understand the concepts and procedures in each topic section and to be able to apply them. To do this the course will be organized into two modules: Lectures and Tutorials/Laboratory sessions. Sometimes four hours of class in a week will be used for lectures according to the perceived need. On the other hand, sometimes 2 hours of class in a week will be organized for lectures, 1 or 2 hours for Tutorials and/or Laboratory sessions.

Lectures: In lectures the instructor will attempt to summarize and explain only selected important concepts and points as clearly as possible. To be familiar with the material presented in lectures and participate in class discussions, students are expected to read the material covered in the previous lectures prior to the class meeting. Students will then find the lectures more interesting, and will benefit from the discussion if they come well prepared.

Tutorials: In addition to the regular lectures, there will be tutorial sessions conducted in the classroom by the instructor and/or assistants. In these hours, extra example problems will be solved. The students are expected to work on the problems. The instructor and/or the assistants are giving the necessary help but don't provide complete solution.

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 Word, Excel, together with general 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 instructor.

Office Hours: The students' timetables will be a base for determining appropriate time slots with zero clash (or minimum number of clashes) as much as possible. If students have difficulty in understanding any material after they have tried their best, they should consult their assistants and instructor during their office hours only. However, if you wish to meet the instructor outside of their office hours, please call him by phone or send an e-mail first to make an appointment.

ASSIGNMENTS

Besides the textbook material, there will be some reading assignments, which will support the lectures. For any type of examination, students are also responsible from studying all assigned readings, even if they might not be discussed in class. Notes will be available on the homepage of the course with the exception of Note 3. The notes are not discussed in the order of their numbering.

METHOD OF ASSESSMENT

Although the student's overall grade will be based on the general assessment of the instructor, the following percentages may give an idea about the relative importance of various assessment tools.

Lab Quizzes	20 %
Quizzes	20 %
Mid-term Exam	25 %
Final Exam	35 %
TOTAL	100 %

Note that the instructor reserves the right to modify these percentages in case he finds it necessary. Letter grade equivalents of numerical performances will be announced by the Registrar's Office after the last day for the submission of letter grades.

EXAM POLICY: Every exam has both essay questions and calculation/modeling problems.

There are two necessary conditions to get a passing grade: (1) the total result must be at least 50.00% (49.99% is not enough!), (2) the total lab quiz result must be at least 10.00% (9.99% is not enough!).

NG (Nil-grade): **Conditions that lead to NG (Nil-grade):**

1. Not attending the **Final Exam** or its **Make-up Exam without a valid excuse**.
2. Not attending the **Mid-term Exam without a valid excuse**.
3. Not attending any one of the **Lab Exams without a valid excuse**.
4. **Having an attendance to lectures/tutorials/labs less than 70%.**

Objections: Any form of document concerning work that is to be used by the instructor as the basis of grading will be shown to the student upon request, **within a week following the announcement of the grade**. The objection to any grade must be made to the assistants within that period. If, after an exam has been graded, you think an error was made in grading or you have questions about the grading of the material, please examine the exam solutions first, and then write your questions or comments on a separate sheet of paper and turn this paper to the assistants.

ATTENDANCE AND NG GRADE

Attendance will be taken every Lecture/Tutorial/Lab session. Note that EMU regulations allow instructors to give a grade of **NG** (Nil Grade) to a student whose absenteeism is more than 30% of the Lecture/Tutorial/Lab hours and/or who do not complete sufficient work that are included in the assessment of the course.

TEXTBOOK/S

Wayne C. Turner, Joe H. Mize, Kenneth E. Case, John W. Nazemetz, Introduction to Industrial and Systems Engineering, Third edition, Prentice Hall, ISBN 0-13-481789-3.

Lecture Notes: Students are expected to make their own notes. Lecture notes and/or overheads used in class will be available for copying. Material presented in class taken from other than the textbook will be made available on the web page of the course (refer to http://www.ie.emu.edu.tr).

EXTENDED READING LIST

Bela Vizvari, Questions, Problems and Critical Thinking to Production Planning, e-book, https://www.interkonyv.hu/konyvek/en/Questions_Problems_and_Critical_Thinking_to_Production_Planning

Note that aside from these books, EMU Library has quite a good collection of books on the intermediate and advanced levels in the related fields of industrial engineering discipline.

TOPICS COVERED and COURSE SCHEDULE

WEEK	TOPICS
1	Technology
2	Systems
3	Scheduling
4	Facility Location and Layout
4	Out-Door Transportation and Traveling Salesman Problem
5	Work Design and Organizational Performance Measurement
6	Forecast
7	Production Planning
8-9	**MIDTERM EXAM WEEK**
10	Engineering Economy
11	Quality Control
12	Accounting
13	Contemporary Issues in Industrial and Management Engineering
14	The History of IE
15-17	**FINAL EXAM WEEKS**

ACADEMIC HONESTY, PLAGIARISM & CHEATING

This is intentionally failing to give credit to sources used in writing regardless of whether they are published or unpublished. Plagiarism (which also includes any kind of cheating in exams) is a disciplinary offence and will be dealt with accordingly. According to university by laws cheating and plagiarism are serious offences punishable with disciplinary action ranging from simple failure from the exam or project/report, to more serious action (suspension from the university for up to one semester). Disciplinary action is written in student records and may appear in student transcripts. Any act not suitable for a university student will not be tolerated and may lead to formal disciplinary action. Example of this are: getting someone else to take the examinations for you, misrepresentation of your own answer sheet as another's work, cheating, knowingly assisting other students to cheat, abusing the tolerance or breaking the discipline of the class.

PLEASE KEEP THIS COURSE OUTLINE FOR FUTURE REFERENCE AS IT CONTAINS IMPORTANT INFORMATION!!!

I read and understood the rules of the course.

Name, surname:

Student ID.

Signature: