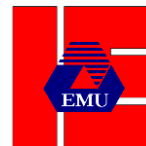




**EASTERN MEDITERRANEAN UNIVERSITY**  
**DEPARTMENT OF INDUSTRIAL ENGINEERING**  
**IENG420 Fundamental of Engineering Economy**  
**COURSE OUTLINE**



<b>COURSE CODE</b>	IENG420	<b>COURSE LEVEL</b>	Fourth Year
<b>COURSE TITLE</b>	Fundamental of Engineering Economy	<b>COURSE TYPE</b>	Department Core/ Area Elective
<b>CREDIT VALUE</b>	(3, 0, 0) 3	<b>ECTS Credit Value</b>	6
<b>PRE-REQUISITE(S)</b>	Senior Standing	<b>CO-REQUISITE(S)</b>	No
<b>PREPARED BY</b>	Faramarz Khosravi	<b>SEMESTER / ACADEMIC YEAR</b>	Fall 22-23

	<b>Name(s)</b>	<b>E-mail</b>	<b>Office</b>	<b>Telephone</b>
<b>LECTURER(S)</b>	Dr. Faramarz Khosravi	<a href="mailto:faramarz.khosravi@emu.edu.tr">faramarz.khosravi@emu.edu.tr</a>	IE-C205	+90 392 630 1587
<b>ASSISTANT(S)</b>	---			
<b>COURSE SCHEDULE</b>	Mondays 16:30-19:20 Office Hour: Mondays 14:30-16:30			
<b>COURSE WEB LINK</b>	<a href="https://staff.emu.edu.tr/faramarzkhosravi/en/teaching/ieng420">https://staff.emu.edu.tr/faramarzkhosravi/en/teaching/ieng420</a>			

### COURSE DESCRIPTION

An introduction to the basis of economic analysis for decision making in engineering design, in manufacturing, in manufacturing equipment, and in industrial projects. Time-value of money, Cash-flow analysis, Cost of capital, Return of investment, Elements of cost and cost estimation, Break-even analysis, Decision making among alternatives, Effects of depreciation, Taxes, Replacement analysis, Inflation.

### AIMS & OBJECTIVES

The purpose of this course is to supplement engineering student's technical training with the knowledge and capability to perform financial analysis especially in the area of capital investment.

#### Course objectives (CO):

1. To use engineering economy factors and different methods for the evaluation of alternatives (Contributing Student Outcomes 1,2,4,6).
2. To carry out sensitivity analysis (Contributing Student Outcomes 1,2,6).
3. To integrate the effects of inflation, depreciation and/or tax into an economic analysis whenever necessary (Contributing Student Outcomes 1,4)
4. To use computer software for engineering economy analysis (Contributing Student Outcomes 1,2,6).

### GENERAL LEARNING OUTCOMES (COMPETENCES)

On successful completion of this course, all students will have developed knowledge and understanding of:

- ❖ The fundamental concepts of engineering economy (CO1),
- ❖ How to use engineering economy factors to account for the time value of money (CO1),
- ❖ Service, revenue, mutually exclusive and independent alternatives (CO1 & 2),
- ❖ How to consider inflation in an engineering economy analysis (CO3),
- ❖ Depreciation and after tax economic analysis (CO3)
- ❖ The assumptions that form the basis of methods applied (CO1 & 2).

On successful completion of this course, all students will have developed their skills in:

- Economic analyses of alternatives using present worth, annual worth, future worth and rate of return methods(CO1)
- Selecting and applying a suitable technique for the comparison of mutually exclusive alternatives (CO1),
- Selecting and applying a suitable technique for the evaluation of independent alternatives (CO1)
- Identifying relevant data to successfully perform an engineering economy study (CO1, 2, 3 & 4),
- Evaluation of public projects using the benefit/cost ratio method (CO1),
- Performing replacement study among an existing asset or system and its possible alternatives (CO1),
- Determining the level of activity necessary or the value of a parameter to breakeven (CO2),
- Using computer software for engineering economy analysis (CO4).

On successful completion of this course, all students will have developed their appreciation of, and respect for values and attitudes to:

- ✓ The role of engineering economy in the decision making process (CO1,2 & 3),
- ✓ The importance of accuracy in estimating costs and revenue and sensitivity analysis to these values (CO2),
- ✓ Consider limitations of the analyses by taking into account the realistic constraints such as environmental, social, political and ethical (CO1, 2, 3 & 4),
- ✓ Understand the impact of engineering solutions in global, environmental and societal context (CO1, 2, 3 & 4),
- ✓ Professional and ethical responsibility (CO1, 2, 3 & 4)

### LEARNING TEACHING METHODS

The function of teaching is to enable students to learn. Therefore students are required to read the chapters of the textbook before coming to class and solve the related end of chapter questions after each lecture. The instructor will lecture in class by writing on the board.

## METHOD OF ASSESSMENT

All Examinations will be based on lectures, discussions and textbook. To enter a formal examination, a student has to present her/his EMU student identification card to the invigilator. It is allowed to bring a calculator. However, it is students' sole responsibility to supply themselves with this physical resource.

**Quizzes:** There will be three quizzes during the semester and the best two marks will be selected (No makeup for quizzes).

**Assignment:** There will be no assignments for this course.

**Midterm Exam:** The midterm exam will be held in the week designated by the university administration. It will cover all of the material up to the date of examination.

**Final Exam:** The final exam will cover the whole course material. In form it will be a longer version of the midterm exam.

**Note 1:** The students need a calculator so they should bring their calculators to all quizzes and other exams.

**Note 2:** The voluntary presentation has up to (5%) bonus. The subjects will be chosen by the student and approved by the instructor..

**Any objection to the grade or mark should be made latest within a week following its announcement. All the announcements regarding to this module will be made via instructors' university web page. It is students' sole responsibility to check announcements on a regular basis.**

### Grading Policy:

✚	Participation	5%
✚	Quizzes	30%
✚	Midterm Exam	30%
✚	Final Exam	35%

Note that the instructor reserves the right to modify these percentages in case it is found necessary. You will be informed from the changes, if any.

## ATTENDANCE

Attendance will be taken every lecture hour. Note that university regulations allow instructors to give a grade of NG to a student whose absenteeism is more than 30% of the lecture hours and/or who do not complete sufficient work that are included in the assessment of the course.

## TEXTBOOK/S

Leland T. Blank, Anthony J. Tarquin "Engineering Economy" 7th edition, McGraw-Hill International Edition, 2012.

### References:

William G.Sullivan, Elin M. Wicks and James T. Luxhoj "Engineering Economy" 14th edn, Prentice Hall, 2009 Chan S. Park, "Fundamentals of Engineering Economy" 2nd edn, Prentice Hall, 2009 Joseph C. Hartman, "Engineering Economy and the Decision Making Process" Prentice Hall, 2007

Week	Topics
1	Course outline & Course planning- Introduction to Engineering Economy
2	Chapter 1: Factors: how time and interest affect money
3	Chapter 2: Combining factors; Nominal and effective interest rates
4	<b>Quiz 1</b>
5	Chapter 3: Present-worth evaluations; Future-worth and capitalized cost evaluations
6	Chapter 4: Equivalent-annual worth analysis
7	<b>Quiz 2</b>
8-9	<b>Midterm Exam</b>
10	Chapter 5: Rate of return analysis of single & multiple alternatives
11	Chapter 6: Benefit cost analysis and public sector economics
12	<b>Quiz 3</b>
13	Chapter 7: Replacement analysis
14	Chapter 8: Breakeven analysis
15- 16-17	<b>Final Exam</b>

### Contribution of the Course to meeting the requirements of Criterion 5

Mathematics and Basic Sciences:	5 %
Engineering Science :	90 %
Engineering Design :	-
General Education :	5 %

### Relationship of Course to Program Outcomes;

<b>Student Outcome</b>	<b>Moderate</b>	<b>High</b>	<b>No</b>
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, analyse 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			√

#### **ACADEMIC HONESTY - PLAGIARISM**

Cheating is copying from others or providing information, written or oral, to others. Plagiarism is copying without acknowledgement from other people's work. According to university by laws cheating and plagiarism are serious offences punishable with disciplinary action ranging from simple failure from the exam or project, to more serious action (letter of official warning suspension from the University for up to One Semester). Disciplinary action is written in student records and may appear in student transcripts.

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