



**EASTERN MEDITERRANEAN UNIVERSITY**  
**Faculty of Engineering**  
**Department of Industrial Engineering**  
**IENG420 Fundamentals of Engineering Economy**  
**COURSE OUTLINE**



<b>COURSE CODE</b>	IENG420	<b>COURSE LEVEL</b>	Fourth Year
<b>COURSE TITLE</b>	Fundamentals 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>SEMESTER / ACADEMIC YEAR</b>	Spring 2023-24

	<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>COURSE SCHEDULE</b>	Gr. 01: Wednesday 16:30-19:20 ;Office Hour: Monday 15:00-16:30 Gr. 02: Monday 16:30-19:20 ; Office Hour: Monday 15:00-16:30			
<b>COURSE WEB LINK</b>	<a href="https://ie.emu.edu.tr/en/department/staff/academic-staff">https://ie.emu.edu.tr/en/department/staff/academic-staff</a> & <a href="https://lms.emu.edu.tr">https://lms.emu.edu.tr</a>			

Office Hour: If students have difficulty in understanding any material after they have tried their best, they should consult their instructor during his office hours. However, if you wish to meet the instructor outside of office hours, please send an e-mail to make an appointment.

#### **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 into an economic analysis whenever necessary (Contributing Student Outcomes 1,4)

#### **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),
- 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),

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 (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 include all the course material taught during the semester.

**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:

- Quizzes 30%
- Midterm Exam 30%
- Final Exam 40%

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 & NG Grade

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" 8th edition, McGraw-Hill International Edition, 2017.

### 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

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

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

Mathematics and Basic Sciences : 0  
Engineering Science : 3  
General Education : 0

## Relationship of Course to Program Outcomes

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	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(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	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(3) an ability to communicate effectively with a range of audiences	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### 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**