ÇANKAYA UNIVERSITY
Department of Industrial Engineering

IE 345 – Engineering Economy

Spring 2026

Instructor:
Selcen Phelps, PhD, MBA, MA
E-mail: ???
Office: L309

Course Schedule:
Tuesday 14:20- 17:10 (HA04)

Office Hours:
Mondays 13:20 - 15:10
Tuesdays 11:20 – 12:10

Textbook: This class is based on:
Leland Blank and Anthony Tarquin, "Engineering Economy", 7th ed., McGraw-Hill Education, (2012). ISBN 978-0071086097.

References: The following reference books are available in the University Library:

- Chan S. Park, "Contemporary Engineering Economics", 6th ed. , Pearson Ed. Ltd., (2016), ISBN 978- 1292109091
- William G. Sullivan, Elin M. Wicks, and C. Patrick Koelling, "Engineering Economy", 16th ed., Prentice Hall, (2014). ISBN 978-0133439274
- Donald G. Newnan, Jerome P. Lavelle, and Ted G. Eschenbach, "Engineering Economic Analysis", 12th ed., Oxford University Press, (2013), ISBN 978-0199339273

Course Web Page:
A web page will be available for this course at https://webonline.cankaya.edu.tr
You will need to access this web page for announcements about class, lecture notes, and assignments.
A copy of the lecture slides will be posted on Moodle at the beginning of every week. You are encouraged to use these slides as a scaffold for the notes that you take during the class.

Course Description:
Foundations of Engineering Economy; How Time and Interest Affect Money; Factor Notation and Cash Flow Diagrams; Shifted Cash Flows and Gradients; Nominal and Effective Interest Rates; Present Worth Analysis; Annual Worth Analysis; Rate of Return Analysis: Single Alternative; Rate of Return Analysis: Multiple Alternatives; Benefit/Cost Analysis and Public Sector Economics; Project Financing; Replacement and Retention Decisions; Breakeven and Payback Analysis; Effects of Inflation

Course Objectives:
The main objectives of this course are:

- to teach the time value of money and economic equivalence
- to teach how to perform benefit-cost analysis
- to equip the students with sufficient knowledge for evaluation of engineering projects and selection of best alternative

- to enlighten the students about the economic service lives of alternatives and making replacement decisions
- to introduce the different capital sources of investments

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

1. the ability to understand the basics of cost analysis and depreciation methods
2. skills in application of analytical and numerical methods for evaluation of engineering projects and selection of best alternatives.
3. an understanding the description of private sector projects, mutually exclusive projects, independent projects and public sector projects.
4. skills to calculate benefit-cost ratios and carry out a benefit-cost analysis.
5. the ability to understand rate of return and incremental analysis, and explain how to determine the rate of return of projects from their cash flows.
6. an understanding of the economic lives of alternatives and the ability to make replacement decisions.
7. the ability to explain the technique of capital budgeting.
8. the ability to perform breakeven analysis among alternatives
9. an awareness of ethical issues surrounding engineering economy

Grading:

Assignments (2@10% ea)	20 %
Case	15 %
Midterm	30 %
Final Exam	35 %
Total	100 %

Attendance Policy:

You are strongly recommended to attend all the lecture hours to understand the course material.

Attendance will be taken every lecture hour.

As per University policy, the minimal requirement is 60% attendance. Any student falling below this limit will not be admitted to the final exam. (*Excused absences, e.g. with medical notes certified by Çankaya University's Health Center, are still counted as absences*.)

Classroom Policies:

Every student is expected to respect the other students' right to learn. Any behavior which distracts or disturbs the other students or the instructor, or disrupts class in any way is unacceptable and will not be tolerated.

This class is best learned through participation in classroom discussions and problem recitations. All students are expected to remain engaged, actively participate, and ask questions in order to maximize their grasp over the principles, tools, and perspectives that will be covered.

The lecture slides made available on Moodle will not contain all the discussion and examples, or the solutions of the problems covered in the class. Students are expected take notes, and review their notes as well as the slides when studying for exams or working on assignments.

Make-up Policy:

A make-up examination for the midterm and the final exam will only be given under highly unusual circumstances (such as serious health or family problems). The student should contact the instructor as early as possible and provide the instructor with proper documentation (such

as a medical note certified by Çankaya University's Health Center). A make-up exam may have a different format and may contain different type of questions than the regular exam.

Conditions that lead to the letter grade "NA":

Not attending the Midterm Exam (or its makeup) or the Final Exam (or its makeup).

Tentative Schedule:

Week	Topics	Book
1	Foundations of Engineering Economy, Time Value of Money and Economic Equivalence	Ch 1
2	Engineering Economy Factors: How Time and Interest Affect Money	Ch 2
3	Combining Engineering Economy Factors + Nominal and Effective Interest Rates	Ch 3-4
4	Nominal and Effective Interest Rates + Methods for Project Evaluation and Selection	Ch 4-5
5	Methods for Project Evaluation and Selection **Assignment 1 due** *(based on Ch 1-5)*	Ch 5-6
6	Rate of Return Analysis: Single Project	Ch 7
7	Rate of Return Analysis: Multiple Alternatives	Ch 8
8	**Midterm** *(based on Ch 1-8)*	
9	Public Sector Projects and Benefit/Cost Analysis	Ch 9
10	Breakeven and Payback Analysis	Ch 13
11	Replacement and Retention Decisions **Case due** *(based on Ch 1-9,13)*	Ch 11
12	Cost Concepts and Basics of Cost Analysis	Ch 15
13	Depreciation Methods **Assignment 2 due** *(based on Ch 11, 15)*	Ch 16
14	Effects of Inflation and Taxes	Ch 14-17
Finals	**Final** *(Comprehensive)*	

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