



ÇANKAYA UNIVERSITY
Faculty of Engineering
Graduate Program in Industrial Engineering

COURSE SYLLABUS

Course Code	: IE 341
Semester	: 2026-2027 Fall
Course Title	: Engineering Economic Analysis
Sections	: 02
Credit	: (3 0 3), 5 ECTS
Type of Course	: Graduate Must Course
Website	: http://ie341.cankaya.edu.tr/

Instructor

Assist. Prof. Dr. Çiğdem Sıcakyüz
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Office: L-319

Course Schedule

Section 1: Tuesday 09:20- 11:10 (LB-05), Friday 10:20- 11:10 (LB-05)
Section 2: Tuesday 11:20- 13:10 (LB-05), Friday 09:20- 10:10 (LB-05)

Office Hours

Section 1: Tuesday 14:00-14:20 (L-319) Section 2: Tuesday 15:00-15:20 (L-319)

Textbook:

Leland Blank, Anthony Tarquin, Engineering Economy, 8th Ed., McGraw-Hill, 2018.

Additional Resources:

1. William G. Sullivan, Elin M. Wicks, C. Patrick Koelling, Engineering Economy, 16th ed., Prentice Hall, 2014.
2. Donald G. Newnan, Jerome P. Lavelle, Ted G. Eschenbach, Engineering Economic Analysis, 12th ed., Oxford University Press, 2013.
3. Chan S. Park, Contemporary Engineering Economics, Pearson, 5th ed., 2011.
4. John A. White, Kenneth E. Case, David B. Pratt, Principles of Engineering Economic Analysis, Wiley, 2010.
5. William G. Sullivan, Elin M. Wicks, James T. Luxhoj, Engineering Economy, Prentice Hall, 2006.

Course Description:

This course provides students with a comprehensive introduction to the fundamental principles and applications of engineering economy. It emphasizes systematic methods for evaluating the economic feasibility of engineering projects and alternatives. Topics include the time value of money, factor notation, and cash flow diagrams; shifted cash flows and gradient series; nominal and effective interest rates; and present worth, annual worth, and rate of return analyses. Students will explore both single and multiple alternative comparisons, as well as benefit/cost analysis in public sector decision-making. Additional topics include project financing, replacement and retention strategies, breakeven and payback analysis, and the impact of inflation on economic evaluations. By the end of the course, students will have the ability to apply economic analysis techniques to real-world engineering and managerial decision problems, supporting rational, data-driven choices in practice.

Course Objectives:

The primary objectives of this course are to introduce students to the fundamental concepts of engineering economics and the time value of money, with an emphasis on economic equivalence. The course aims to develop the ability to perform benefit–cost analysis and to provide sufficient knowledge for evaluating engineering projects and selecting the best alternatives.

Course Learning Outcomes:

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

1. knowledge of the effects of time, money, interest rate, and inflation on the value of money
2. ability to formulate engineering economic problems and make present/annual/future worth, rate of return, and benefit/cost analysis
3. skills in analyzing and comparing project alternatives using different evaluation methods
4. the capability to make replacement and retention analysis
5. understanding of sources of project financing, debt-equity mix, and cost of capital
6. skills in using online learning platforms, following instructions

On successful completion of the course, all students will be:

7. aware of ethical issues, including the responsible and transparent use of AI-assisted tools (see Academic Integrity and Use of AI Tools).

Tentative Course Schedule:

Week	Topic
1	Foundations of Engineering Economy
2	Factors: How Time and Interest Affect Money
3	Combining Factors
4	Shifted Cash Flows and Gradients
5	Nominal and Effective Interest Rates
6	Present Worth Analysis
7	Annual Worth Analysis
8	Rate of Return Analysis: Single Alternative
9	Rate of Return Analysis: Multiple Alternatives
10	Benefit/Cost Analysis and Public Sector Economics
11	Project Financing
12	Replacement and Retention Decisions
13	Breakeven and Payback Analysis
14	Effects of Inflation

Course Web Page:

A course web page will be available at <https://webonline.cankaya.edu.tr>. Students should regularly access this page for updates on class announcements, lecture notes, and assignments. Lecture slides may not cover all in-class discussions and problem solutions, so students are encouraged to attend classes and take detailed notes.

Grading:

Method	Number	Contribution (%)
Midterm	1	30%
Final Exam	1	40%
Assignments (includes quiz)	3	15%
Project	1	15%
Total		100%

Details:

Assignments are designed to assess students' understanding of key engineering economy principles. This component will contribute 15% of the total course grade. The assignment score will include **regular assignments (10%)** and **an unannounced quiz (5%)**.

The unannounced quiz may be given during any class without prior notice. It will serve to evaluate students' understanding of recently discussed topics and encourage continuous engagement. Students who miss the quiz due to absence will not have the opportunity for a make-up. Regular attendance is essential for success in this course.

Project

As part of the course, students will complete a term project applying the analytical methods covered in class to a real or realistic engineering investment decision.

Scope: Working in groups of 4–5 students, each team selects a real or realistic engineering investment decision (e.g., equipment replacement, a renewable energy investment, an energy-efficiency retrofit, or a facility expansion) and performs:

- A cash flow diagram of the proposed investment.
- At least two of the following analyses: Present Worth, Annual Worth, or Rate of Return.
- A comparison of alternatives, where applicable.
- A sensitivity analysis showing how the outcome changes with interest rate or key cost assumptions.

Detailed project topics, team formation guidelines, deliverable requirements, and the evaluation rubric will be announced on the course web page (WebOnline) by Week 5.

Make-up Policy:

A make-up examination for the midterm or final exam will only be given under exceptional circumstances (such as serious health problems). The student must contact the instructor as early as possible and provide proper documentation (e.g., a **medical report certified** by Çankaya University's Health Center). A make-up exam might contain different types of questions than the regular exam.

Attendance Requirement and Examination Policy

Attendance will be recorded manually at the start of each class session. Students are required to sign the attendance sheet to confirm their presence. Failure to sign the sheet will result in the student being marked absent for that session.

By the decision of the University Senate, a **minimum 60% attendance** is **mandatory** for the course.

In accordance with Article 24 of the Çankaya University Associate and Undergraduate Education and Examination Regulations, the following rules apply:

- (4) For courses with a final examination, the examination procedure is as follows:
 - c) Students who fail to meet the attendance requirement are **not permitted to take the final exam**. If such a student takes the exam, the exam will be considered invalid.
- (9) Medical reports and make-up examinations:
 - d) Days covered by **medical reports** are **counted as absences**.

Conditions that Lead to an "NA" Grade

Any of the following may lead to receiving the letter grade **NA (Not Attended)**:

- If a student fails to attend at least **60%** of the lectures, they will not be allowed to take the final exam and will receive a grade of **NA**.
- If a student fails to take the **midterm exam** or the **final exam** without valid documentation, they will receive the letter grade **NA**.

Classroom Policy

Students are expected to maintain a professional and respectful environment in class. Disruptive behavior, including the use of mobile devices for non-course-related purposes, will not be tolerated. Participation in discussions and problem-solving exercises is highly encouraged to enhance learning.

You are responsible for all announcements made in class and on the class web page, as well as printing the lecture notes and other cited materials from the class web page and other sources.

Audio or video recording, or taking photographs, during class is not permitted without the instructor's explicit permission.

Unauthorized recording or sharing of any class content, including lectures, slides, discussions, or images of the instructor or students, is strictly prohibited due to privacy and data protection considerations.

Any violation of this policy may result in the recording being deleted and the activity being treated as misconduct.

Use of Artificial Intelligence (AI) Tools

During exams, the use of electronic devices (mobile phones, tablets, smartwatches, or any internet-enabled devices) is strictly prohibited. Therefore, the use of AI tools is automatically not permitted during examinations.

For homework and the project, limited use of AI tools (e.g., ChatGPT or similar systems) is permitted only for support purposes such as brainstorming, language editing, or conceptual clarification. AI tools must not be used to generate solutions, answers, reports, or any content that is submitted as the student's own work.

Any AI assistance must be clearly disclosed. Undisclosed or excessive AI-generated work will be treated as academic dishonesty.

If unauthorized AI use is detected, the assignment or project will be considered invalid, receive **a grade of zero**, and may be subject to disciplinary action.

Honesty Policy

Academic integrity is expected of students of Cankaya University at all times, whether in the presence or absence of the faculty. All students should declare their understanding and belief in the Honor Code for the examinations and assignments. This statement is a reminder of your obligation as a student to uphold honesty in all work submitted and exams taken in this course and all others.

If you conduct any dishonest act during an examination or for the completion of an assignment (i.e., cheating on an exam, using any extra material that you are not allowed to use during an exam, copying material off of someone else's homework or assignment, using solution keys from previous years, copying material from published and electronic sources without paraphrasing and/or citing appropriately), you will get a credit of zero on that particular exam or assignment. Necessary disciplinary action, as required by the University's rules, will also be taken.

Honor Code Agreement and Submission

All students must acknowledge and agree to the course rules and academic integrity policy by submitting a signed Honor Code form.

Students are required to:

1. Handwrite the Honor Code statement
2. Sign it using a blue-ink pen
3. Upload the file to WebOnline by the end of the Add-Drop week

Failure to submit the signed form may result in being considered non-compliant with course requirements.

Students involved in any dishonest act will receive a grade of zero for the relevant exam or assignment

Naming of Honor Code file: IE341_HonorCodeStatement_NameSurname_StudentID_2026F

Changes to the Syllabus: The instructor reserves the right to make changes to the syllabus as necessary. Any changes will be announced on the course website.