University of Illinois at Urbana-Champaign
Department of Industrial and Enterprise Systems Engineering
Spring 2025

SE 261 Introduction to the Business Side of Engineering

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TA: Mr. Duo Zhou
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Office hrs.: Tuesday & Thursday After Class

Class Schedule: Tuesday & Thursday 2-250pm Room 103 Transportation Building

Catalog Description

Important elements and metrics of business and contemporary engineering economics: wealth creation, cash flow diagrams, internal rate of return, net present value, breakeven analysis, companies, corporations, profits, prices, balance sheets, income statements, and the basics of business plan writing. Particular emphasis is given to preparation for the economic analysis component of engineering practice.

Course Description

An introduction to concepts of economic decision making including present worth analysis, cash flow equivalence, replacement analysis, equipment selection. Two lecture periods per week. This course is required of all Systems Engineering and Design and Industrial Engineering students and is open to students in any discipline.

Course Overview

This undergraduate level course is a comprehensive coverage of concepts in engineering economics. It presents mathematical techniques and practical advice for evaluating decisions in the design and operation of engineering systems. These procedures support both selection and justification of design alternatives, operating policies, and capital expenditure. The topics covered include time value of money, financial evaluation methods, depreciation and inflation, income taxes, project financing, replacement analysis, notions on capital budgeting and sensitivity, and risk analysis. Brief introduction to engineering ethics. At a more personal note, it will help you make financially prudent decisions in your day-to-day life. It will help you in your FE/PE examinations in future.

Prerequisites

- Algebra and Basic calculus
- Notions of financial matters - banks, interest
- General understanding of engineered objects

Course References and Software

[1] Required - Park, Chan S., Contemporary Engineering Economics, 6th Ed., Pearson (2016) or newer
[2] Required – Engineering/Financial Calculator, cell phone / smart watch not allowed
[3] Optional - Blank & Tarquin; Sullivan, Wicks & Luxhoj; Hartman; Newnan, Lavelle & Eschenbach.
[4] Optional - EzCash, Park, Chan S., Download from http://www.eng.auburn.edu/users/parkcha/cee/
[5] Optional - Financial Calculators https://web.njit.edu/~wolf/calculator.html

Course Web Page: Canvas (canvas.illinois.edu)

Course Objectives

Students completing this course will be able to understand:

- the concepts of interest and time value of money; product/project costs and financial statements
- how to evaluate engineering projects with economic decisions using present worth, annual worth and rate of return analyses
- the impact of depreciation and taxation on project decisions
- make decisions based on the National Society of Professional Engineers Code of Ethics for Engineers
- how to make financially prudent decisions in everyday life (car/home loans or investments).

Course Topics

1. Engineering Economic Decisions
2. Understanding Financial Statements
3. Interest Rate and Economic Equivalence
4. Understanding Money and Its Management
5. Present Worth Analysis
6. Annual Worth Analysis
7. Rate of Return Analysis
8. Cost concepts
9. Depreciation and Income Taxes
10. Inflation
11. Replacement Decisions
12. Project, Sensitivity and Risk Analysis

Required Work and Grading Policy

1.	Homework	- weekly assignments	15%
2.	Quizzes/Class participation	- pop-up	15%
3.	Exams	- two midterms (30% combined), comprehensive final (25%)	55%
4.	Project (Group of 6)	- Final report, presentation etc…	15%

Group study of a real-life engineering case is to be performed during the semester. A report will be due at the end of the semester defining the problem, establishing the data collected, and the engineering economic decisions made. Formal application of learned concepts must be demonstrated. Consider that you are making your recommendations to a management team.

Final Letter Grades

Grade Range	Grade	Grade Range	Grade
91 ≤ Average < 100	A	77 ≤ Average < 79	C+
89 ≤ Average < 91	A-	71 ≤ Average < 77	C
87 ≤ Average < 89	B+	69 ≤Average < 71	C-
81 ≤ Average < 87	B	67 ≤Average < 69	D+
79 ≤ Average < 81	B-	60 ≤Average < 67	D
		Average < 60	F

Computer Usage and Academic Honesty: Students are expected to use computer spreadsheets (or EzCash-like software) in completing some homework sets. Submissions of spreadsheets should include two separate printouts of formulas as well as values. Plagiarism will constitute grounds of University Sanctions including immediate failure in course for reason of academic dishonesty; see https://studentcode.illinois.edu/article1/part4/1-402/