

University of Illinois at Urbana-Champaign
Department of Industrial and Enterprise Systems Engineering
IE 430 Economic Foundation of Quality Systems
Fall 2016

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Class Schedule: Tu, Th: 3:30-4:50 p.m., 112 Transportation Building (CRN # 30402)

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 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. 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 Optional References and Software

- [1] Park, Chan S., Contemporary Engineering Economics, 5th Ed., Prentice Hall (2011).
- [2] Blank and Tarquin; Sullivan, Wicks and Luxhoj; Hartman; Newnan, Lavelle and Eschenbach.
- [3] EzCash, Park, Chan S., Download from <http://www.eng.auburn.edu/users/parkcha/cee/>
- [4] Financial Calculators <https://web.njit.edu/~wolf/calculator.html>

Course Web Page: Compass2g (compass2g.illinois.edu); Lecture notes might not be available.

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
- 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 20%
2. Quizzes/Class participation - 10%
3. Project (Group of 6) - 10%
Option 1: 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 concept learnt must be demonstrated. Consider that you are making your recommendations to a management team.
Option 2: Group programming projects that are similar to EzCash are to be developed. End semester submission will include the software and a report that details the system architecture, users and reference guides.
4. Exams - two midterms (18% each), comprehensive final (24%) 60%
(+/- Grading scheme will be in effect)

Final Letter Grades

Grade Range	Letter Grade
$91 \leq \text{Average} < 100$	A
$89 \leq \text{Average} < 91$	A-
$87 \leq \text{Average} < 89$	B+
$81 \leq \text{Average} < 87$	B
$79 \leq \text{Average} < 81$	B-
$77 \leq \text{Average} < 79$	C+
$71 \leq \text{Average} < 77$	C
$69 \leq \text{Average} < 71$	C-
$67 \leq \text{Average} < 69$	D+
$60 \leq \text{Average} < 67$	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 http://studentcode.illinois.edu/article1_part4_1-401.html).