

IME 320 ENGINEERING COST ANALYSIS

Winter 2001

MWF 11:00 – 11:50 a.m.

Catalog Description: A course in engineering economics and the economic comparison of alternative technical systems. Includes interest, equivalence, depreciation, taxes, and risk. NOT FOR ENGINEERING CREDIT. Prerequisite: MATH 200.

Textbook: Vajpayee, S. Kant, Fundamentals of Economics for Engineering Technologists and Engineers, (Upper Saddle River: Prentice Hall, 2001)

- References:**
1. Collier, Courtland A. and Glagola, Charles R., Engineering Economic and Cost Analysis, (Menlo Park: Addison Wesley Longman, Inc., 1998, Third Edition). [TA177.4 .C65 1998]
 2. Sullivan, William G., Bontadelli, James A., and Wicks, Elin M., Engineering Economy, (Upper Saddle River: Prentice-Hall, 2000, Eleventh Edition). [TA177.4 .E539 2000]
 3. Blank, Leland T. and Tarquin, Anthony J., Engineering Economy, (McGraw Hill, 1998, Fourth Edition). [TA177.4 .B58 1998]

**Instructor/
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Office Hours: MW 10:15 – 11:00 a.m., F 9:00 – 11:00 a.m.

Long Term Behaviors:

In the future, students completing this course can:

1. Be used as financial evaluators to judge the soundness in the selection of projects (from a large list) when working with constrained resources.
2. Be asked to advise on suitability of a specific depreciation method best suited for a given situation in order to minimize taxes.
3. Regularly make financial investment decisions consistently resulting in above average returns on their personal portfolio with reduced tax liabilities.
4. Quickly be able to adapt to using new computerized techniques as they are developed.

Prerequisites by Topics:

1. A good knowledge of formulating and solving algebraic equations.
2. A knowledge of functions (MATH 200).
3. Ability to solve logarithmic and exponential functions (MATH 200).

Course Objectives¹:

At the end of the semester, the student should be able to:

1. Determine the time value of money for any type of cash flow (b, f).
2. Evaluate multiple alternatives to determine the best one (b, f).
3. Determine the depreciation of a tangible asset using a variety of methods (b, i).
4. Calculate income taxes for a corporation or an individual (b, f).
5. Use spreadsheets for financial analysis (a, f).

¹ Letters in parentheses at the end of each objective refer to the TAC of ABET 2001 criteria.

Course Schedule:

<u>DATE</u>	<u>TOPIC</u>	<u>CHAPTER</u>
1- 3	Course Introduction	1
1- 5	Simple and Compounding/Problem Solving Procedure	1
1- 8	Cash flows	2
1-10	Single Payment	3
1-12	Single Payment	3
1-15	MLK Day Recess & Convocation Activities	
1-17	Single Payment	3
1-19	Multiple Payments	4
1-22	Multiple Payments	4
1-24	Multiple Payments	4
1-26	EXAMINATION #1	1-3
1-29	Multiple Payments	4
1-31	Multiple Payments	4
2- 2	Multiple Payments, <i>Computer Assignment #1</i>	4
2- 5	Payback Period	5
2- 7	Payback Period, <i>CA#1 due</i>	5
2- 9	Present Worth	6
2-12	Present Worth	6
2-14	Present Worth, <i>Computer Assignment #2</i>	6
2-16	Present Worth	6
2-19	Future Worth, <i>CA#2 due</i>	7
2-21	EXAMINATION # 2	4-6
2-23	Future worth	7
2-26 to 3-2	SPRING BREAK (No classes)	
3- 5	Annual worth	8
3- 7	Annual Worth	8
3- 9	Rate of Return, <i>Computer Assignment #3</i>	9
3-12	Rate of Return	9
3-14	Rate of Return, <i>CA#3 due</i>	9
3-16	Rate of Return	9
3-19	Benefit-Cost Ratio	10
3-21	Benefit-Cost Ratio	10
3-23	EXAMINATION # 3	7-10
3-26	Comparison of Different Methods	11
3-28	Comparison of Different Methods, <i>Computer Assignment #4</i>	11
3-30	Depreciation	12

<u>DATE</u>	<u>TOPIC</u>	<u>CHAPTER</u>
4- 2	Depreciation	12
4- 4	Depreciation, <i>CA#4 due</i>	12
4- 6	Depreciation	12
4- 9	Income Tax	13
4-11	Income Tax	13
4-13	Course Review	
4-19 (Thur)	COMPREHENSIVE FINAL EXAMINATION #4 (10:15 – 12:15 p.m.)	1-11

Home Work Problems:

There are numerous problems at the end of each chapter. The only way you can understand the subject material and do well in this course is by actually solving problems. Hence, it is recommended that you solve as many of the problems as possible. Not only will this help you to understand the basic concepts but also considerably reduce the amount of time you will need to solve a problem. Both of these will benefit you when taking the examinations. It is suggested that you keep a 70-page spiral bound notebook just for the problems. In this way, all your solved problems will be in one location and serve as a good review guide prior to an examination. If you have difficulty in solving any problem, inform the instructor at the beginning of the lecture.

Library Usage:

There are several books on the subject of Engineering Economy housed in Waldo Library containing numerous solved problems. Three of these books have been identified under References [with the call numbers]. It is strongly recommended that the student use at least these three books to study the solved examples. This will greatly enhance his/her ability to analyze problems and determine the approach to be taken for solving any given problem.

Computer Assignments:

Four computer assignments will be given during the semester on the dates specified above and you must use EXCEL to solve each assignment. These computer assignments must be completed and submitted by 11:00 a.m. on the due date. Any assignment submitted from 11:01 a.m. onwards WILL RECEIVE A 'ZERO'. You will submit the assignment as an attached file by an email to the instructor with a copy to yourself. Save your email copies as proof that you have submitted the assignment. The assignments will be graded and only those not receiving full points on the assignment will receive feedback by email from the instructor. Submission of all assignments is mandatory to pass the class.

Quizzes:

Five unannounced quizzes will be given during the semester. These will be administered for the first 15 minutes of the class period. If you are late, you will not get additional time and if you are absent, you will receive a zero for that quiz. The four highest scores (of the five total) will be counted towards the grade. A quiz will not be given if an exam is scheduled on that day.

Evaluation Distribution:

1. Examination # 1	20%
2. Examination # 2	20%
3. Examination # 3	20%
4. Examination # 4	20%
5. Four Quizzes	10%
6. Computer Assignments	10%
Total	100%

Grading Scale:

The following grading scale will be used in my class:

A (91 – 100), **BA** (88 – 90), **B** (81 – 87), **CB** (78 – 80), **C** (71 – 77), **DC** (68 – 70), **D** (60 – 67), **E** (below 60).

Attendance at all exams is necessary and no make-up exams will be given. All examinations, quizzes, and computer assignments will be graded on a numerical scale. At the end of the semester, the grades will be added up for all the items (with the appropriate weights) and then converted to a letter scale to determine the final course grade.

Performance Criteria²:

- Objective 1. Be able to determine the time value of money for any given cash flow [1, 2, 3, 4, 5, 6].
- Objective 2. Be able to evaluate multiple alternatives to determine the best alternative using several different methods [2, 3, 4, 5, 6].
- Objective 3. Be able to compute depreciation of a tangible asset by a variety of methods and determine its effect on taxes [4, 5].
- Objective 4. Be able to compute the income taxes for a corporation and for an individual [4].
- Objective 5. Have the ability of using computerized spreadsheets for analyzing and evaluating a variety of financial problems [6].

²Numbers in brackets refer to the method of evaluation as listed in the previous section.