

## IME 3200 ENGINEERING COST ANALYSIS

Spring 2011 (CRN: 11962)

MW 11:30 am – 12:20 pm (Rm. C 229)  
F 11:30 am – 12:20 pm (Rm. C 226)

**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: Prerequisite: Recommended, MATH 1220 or MATH 2000 or MATH 1700.

**Textbook:** Newnan, Donald G., Jerome P. Lavelle, and Ted G. Eschenbach, Engineering Economic Analysis, (New York: Oxford University Press, 2009, Tenth Edition).

**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., Wicks, Elin M., and James T. Luxhoj, Engineering Economy, (Upper Saddle River: Prentice-Hall, 2003, Twelfth Edition). [TA177.4 .E539 2003]

**Instructor/Coordinator:** *Name:* Dr. Kailash M. Bafna, Professor  
*Office:* E-212 Parkview Campus  
*Phone:* (269) 276-3355  
*Email:* [kailash.bafna@wmich.edu](mailto:kailash.bafna@wmich.edu) (send **all** emails here)  
*WebCT Access:* <https://elearn.wmich.edu>  
*Office Hours:* MW 9:30-10:20 am., T 10:30-11:20 am.

**Long Term Behaviors:**

In the future, students completing this course can:

1. Use spreadsheet analysis for solving financial problems of all types.
2. Be used as financial evaluators to judge the soundness in the selection of projects (from a large list) when working with constrained resources.
3. Be asked to advise on suitability of a specific depreciation method best suited for a given situation in order to minimize taxes.
4. Regularly make financial investment decisions consistently resulting in above average returns on their personal portfolio with reduced tax liabilities.

**Prerequisites by Topics:**

1. A good knowledge of formulating and solving algebraic equations.
2. Differential and integral calculus. (MATH 1220).

**Course Objectives:**

<u>Course Objectives</u>	<u>Performance Criteria</u> <sup>1</sup>	<u>ABET/TAC Outcomes</u> <sup>2</sup>
1. Determine depreciation of a tangible asset using a variety of methods	B3 Uses appropriate engineering, science, and mathematical tools for decision making (OR, statics, materials, etc.)	b
2. Calculate income taxes for a corporation or an individual	I4 Demonstrates a knowledge of professional codes	i

3. Evaluate multiple alternatives using time value of money techniques	F3 Applies tools and modeling techniques suited to the problem	f*
4. Use spreadsheets for financial analysis	A2 Demonstrates the use of one or more tools (CAD, Word, Excel, PowerPoint, CAE) in presentation, analysis, research of a design	a*
5. Solve real-world problems in engineering cost analysis	F4 Did you improve your ability to solve real problems in this field?	f*

<sup>1</sup>**Performance Criteria:** IME performance criteria may be found at <http://www.wmich.edu/ime>

<sup>2</sup>**ABET/TAC Outcomes:** Outcomes may be found at <http://www.abet.org/>

**Course Schedule:**

<u>WEEK OF</u>	<u>TOPIC</u>	<u>CHAPTER</u>
1-10	Course Introduction Making Economic Decisions, Engineering Costs & Cost Estimating	1 1, 2
1-17	<b>MLK Day Convocation &amp; Activities (No Classes on Monday, 1-17)</b> Engineering Costs & Cost Estimating Interest & Equivalence	 2 3
1-24	<b>SQ1</b> , Interest & Equivalence More Interest Formulas <b>Trial Quiz (1-26)</b>	3 4
1-31	<b>SQ2</b> , More Interest Formulas <b>Quiz #1 (2-2)</b> <i>Excel Assignment #1 (Posted on 2-4, due 2-9)</i>	4
2- 7	<b>SQ3</b> , More Interest Formulas Present Worth Analysis <b>Quiz # 2 (2-9)</b>	4 5
2-14	Present Worth Analysis <b>EXAMINATION #1 (2-16)</b>	5 <b>1-4</b>
2-21	<b>SQ4</b> , Annual Cash Flow Analysis <b>SPIRIT DAY (No Classes on Friday, 2-25)</b>	6
2-28 to 3-4	<b>SPRING BREAK (No Classes)</b>	
3- 7	Rate of Return Analysis	7
3-14	<b>SQ5</b> , Choosing the Best Alternative <i>Excel Assignment #2 (Posted on 3-18, due 3-23)</i>	8
3-21	<b>SQ6</b> , Other Analysis Techniques <b>Quiz #3 (3-23)</b>	9
3-28	<b>SQ7</b> , Other Analysis Techniques	9

	Depreciation	11
	<b>EXAMINATION # 2 (3-30)</b>	<b>5-9</b>
4- 4	<i>SQ8</i> , Depreciation	12
4-11	<i>SQ9</i> , Depreciation	11
	Income Taxes	12
	<i>Excel Assignment #3 (Posted on 4-15, due on 4-20)</i>	
4-18	<i>SQ10</i> , Income Taxes	12
	<b>Quiz #4 (4-20)</b>	
4-27 (Wed)	<b>COMPREHENSIVE FINAL EXAMINATION (10:15 am – 12:15 pm)</b>	<b>1-12</b>

### **Format for the Class:**

The instructor plans to take this class to a higher level of learning. As such, after the first week of classes, he will record the lectures by topics and post them on the Web for streaming. The students will be required to view these lectures on their own on a computer according to the chapter schedule given in the syllabus. The class will meet on Mondays and Wednesdays. The purpose of these class meetings will be for students to (1) take quizzes and exams as scheduled (Wednesdays only), (2) ask specific questions on material covered in the streaming videos, and (3) to solve problems in class. The responsibility for “attending” the “electronic (video) lectures” rests with the students as “traditional” lectures will not be delivered in class (see the next section titled Short Quizzes) .

### **Short Quizzes:**

On most of the Mondays, a short quiz will be held from 12:15 pm for 5 minutes. Students will take the quiz on WebCT in class. A password will be given to the students present in that class to access the quiz. Only one attempt is allowed for each quiz which will be computer graded. Each quiz will consist of five multiple choice questions with one point assigned to each correct answer. As such, each short quiz (SQ in course schedule) will consist of 5 points with a total possible score of 50 points in the 10 short quizzes that have been scheduled. The multiple choice questions in each quiz can only be answered if you have viewed and understood the videos assigned for the previous week. Since the short quizzes are worth 10% of your course grade, hence each quiz will impact 1% of the course grade. Therefore, it is imperative that you view and understand the posted videos each week on a regular basis. If you have any questions on the material in the videos, these can be clarified in class before the short quiz (which is scheduled to be taken during the last five minutes of the class).

### **Home Work Problems:**

The only way you can understand the subject material and do well in this course is by actually solving problems. There are numerous problems given at the end of each chapter. The answers to all the end-of-chapter questions are posted on the WebCT Vista course site. It is strongly recommended that you solve all the questions shown shaded in the answers on WebCT Vista yourself. 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. This will benefit you when taking the quizzes and examinations. If you have difficulty in solving any problem, you can see the instructor in his office during office hours or inform the instructor at the beginning of the lecture. Solve all the questions in Chapters 3 and 4 using formulas and factors. Also solve as many of these problems as possible in Excel so that you become familiar in using Excel. Solve all the questions from chapter 5 onwards using Microsoft Excel. Quiz #3, Quiz #4, Examinations #2, and the Final Examination (#3) will be in Excel only.

### 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 books to study the solved examples and also solve them using Excel. This will greatly enhance his/her ability to analyze problems and determine the approach to be taken for solving any given problem.

### Spreadsheet Assignments:

Three computer assignments will be posted during the semester on the days specified in the course schedule and you must use Microsoft Excel to solve each assignment. These computer assignments must be completed and submitted by 9:30 am on Wednesday of the following week.. Any assignment submitted from 9:31 a.m. and onwards of the due date WILL RECEIVE A 'ZERO'. You will submit the assignment through the Vista Assignment Dropbox. Submission of all assignments is mandatory to pass the class. In doing the assignments, you may seek assistance from another student/instructor. However, you should not complete the assignment with another student.

### Quizzes:

A total of four quizzes will be given on the dates specified in the Course Schedule. These will be administered during the first 20 minutes of a class period. The quizzes will be made available through the Assignment Dropbox in Vista and, upon completion, must be submitted back to the Assignment Dropbox. If you are late, you will not be given additional time and if you are absent, you will receive a zero for that quiz. The three highest scores (of the four total) will be counted towards the grade.

### Examinations:

A total of three examinations (#1, #2, and Finals) will be given through the Assignment Dropbox in Vista on the dates specified in the course schedule.

### Evaluation Distribution:

1.	10 Short Quizzes	10%
2.	3 Excel Assignments	10%
3.	3 Quizzes (lowest dropped)	10%
4.	Examination # 1	20%
5.	Examination # 2	25%
6.	Examination # 3	25%
	<b>Total</b>	<b>100%</b>

### Grading Scale:

The following grading scale will be used in my class:

**A** (91–100 ), **BA** (86–91 ), **B** (81– 86), **CB** (76–81), **C** (71–76), **DC** (66–71), **D** (60–66), **E** (below 60).

Attendance at all three examinations is mandatory and no make-up exam will be given. All examinations, quizzes, and spreadsheet 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. In order to pass the course, **one's overall score must be in the passing range and also he/she must obtain (i) a passing grade (D or higher) in any two exams (to receive a grade of C or higher in the course), or (ii) a passing grade (D or higher) in at least one exam (to receive a grade of D or DC).** If you fail in all three exams, you will fail the course.

### Academic Honesty:

You are responsible for making yourself aware of and understanding the policies and procedures in the Undergraduate and Graduate Catalogs that pertain to Academic Honesty. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. [The policies can be found at <http://catalog.wmich.edu> under Academic Policies, Student Rights and Responsibilities.] If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Conduct. You will be given the opportunity to review the charge(s). If you believe you are not responsible, you will have the opportunity for a hearing. You should consult with your instructor if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test.