

COURSE OUTLINE
ENGINEERING DECISION MAKING
ENGR 2110
(Three Credit Hours)

BIOLOGICAL & AGRICULTURAL ENGINEERING DEPARTMENT

THE UNIVERSITY OF GEORGIA

ATHENS, GA 30602-4435

2009

ENGR 2110 Engineering Decision-Making
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Biological and Agricultural Engineering Department

Instructor

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UGA Bulletin Course Description

Economics, Finance, Quantitative Applied to Engineering Decision Making

<u>Offered</u>	<u>Credits</u>	<u>Level</u>	<u>Weekly Class Meeting Pattern</u>
Fall, Spring	3	Undergraduate	Two 75 minute classes

Course Prerequisites

Math 2200

Text

***Engineering Economic Analysis* 10th edition**

By Donald G. Newman, et. al., Oxford Press

References

None

FINAL EXAM: Hopefully Tuesday May 5

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Topics (Number of 1 hr classes)

1.	Decision Process	(1 cl)
2.	General Interest Rate Problems	(3 cl)
3.	Problem Solving With Spreadsheets	(2 cl)
4.	Present Value Analysis	(3 cl)
5.	Exam 1	(1 cl)
6.	Annual Cost Comparisons	(2 cl)
7.	Internal Rate of Return Analysis	(2 cl)
8.	Incremental Analysis	(1 cl)
9.	Exam 2	(1 cl)
10.	Payback, Breakeven, and B/C Ratio	(2 cl)
11.	Depreciation	(2 cl)
12.	Taxes	(4 cl)
13.	Inflation	(1 cl)
14.	Exam 3	(1 cl)
15.	Basic accounting techniques for Engineers	(2 Cl)
16.	Investment decision making	(2 cl)
17.	Personal finance	(2 cl)
18.	FE materials	(2 cl)

Exams during the later part of the course will be require Excel so learning how to use the spreadsheet is important. The exact content of the exams will be determined when the exam date is set, at least two class periods before the exam.

Laboratory Exercises

Topics assigned daily: be sure to check your UGA email account

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ABET EC-2000 Criterion 3 Program Outcomes

- A. An ability to apply knowledge of mathematics, science and engineering
- B. An ability to design and conduct experiments, as well as to analyze and interpret data
- C. An ability to design a system, component, or process to meet desired needs
- D. An ability to function on multi-disciplinary teams
- E. An ability to identify, formulate, and solve engineering problems
- F. An understanding of professional and ethical responsibility
- G. An ability to communicate effectively
- H. The broad educational necessary to understand the impact of engineering solutions in a global and societal context
- I. A recognition of the need for, and an ability to engage in life-long learning
- J. A knowledge of contemporary issues
- K. An ability to use techniques, skills and modern engineering tools necessary for engineering practice

Overall Course Contribution to Program Outcomes

- A. Moderate
- B. Moderate
- E. Moderate
- H. Moderate
- I. Moderate
- J. Moderate

Method of Grading

Average of three hourly exams	70%
Final exam	25%
Daily grade (to be determined how graded) Homework Assignments)	5%
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	100%

Revision

Spring 2009

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Additional Information

GENERAL INSTRUCTIONS

1. You are expected to attend all class meetings. Please read the UGA Bulletin statement on "Class attendance" and "Withdrawal from Courses." If you miss a class, it is your responsibility to determine the assignment and learn the material covered in the class you have missed.
2. Have theory studied and problems solved by the date assigned.
3. Exams and quizzes will be "open book" unless otherwise announced.
4. Short unannounced quizzes may be given periodically.
5. Problem assignments will be collected periodically to check your progress and your development of good problem solving techniques. These are due at the beginning of class and will not be accepted later.
6. Present your problems in a neat and orderly fashion. Clarity will be considered in grading.
7. Please read and follow the UGA Bulletin statement on Academic Honesty. Remember you signed the UGA Honor Code.

SPECIFIC INSTRUCTIONS:

In order to succeed in mastering the subject matter covered in this course, you must work homework problems individually and participate in class discussions.

GRADING:

Three one-hour exams will be given during the semester with no make-up exams. You will be given a grade of zero on an assigned exam if you do not take the exam.

Assignments will be collected at the beginning of class on the due date. Assignments submitted later that day will be reduced by 20%. Each subsequent day will result in an additional 20% reduction in grade. These assignments are worth 5% of your total grade.

The final class grade will be based on the point system below:

94-100	A
90-93.9	A-
87-89.9	B+
84-86.9	B
80-83.9	B-
77-79.9	C+
70-76.9	C
67-69.9	D+
65-66.9	D
60-64.9	D-
<60	F

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I am not posting specific hours for assistance with ENGR 2110 but immediately after class is always good. Please contact me after class to make an appointment if this won't work. Also, feel free to send an e-mail or call to make an appointment. Leave a message on my answering machine and I will return your call or if all else fails, come by my office I am here most days.

TOPIC OUTLINE

- K. Decision Process and Decision Making
 - II. Compound Interest Concepts
 - III. Present Value Analysis
 - IV. Equivalent Annual Evaluation
 - V. Internal Rate of Return Analysis
 - VI. Future Value Analysis, Payback
 - VII. Benefit-Cost Analysis
 - VIII. Depreciation, Taxes and Inflation
 - IX. Future Events Estimation
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A complete understanding of areas II and III will be necessary to complete the course; therefore, class attendance and homework assignments are also mandatory during this stage of the class.

Assistance will be offered in the use of spreadsheet operations for solving the standard financial. You can sign on the computers in the lab using your MYID. Please remember to save what work you do either to a removable drive or email it to yourself.

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Additional Comments

- I. The problem areas that we will address here will be those that are relatively well structured and have a solution that is recognized as acceptable. We will find that all acceptable solutions may not be absolutely correct; this is where the skills that you learn in this class may be limited. There are real world problems that cannot have solutions that are optimal results but only satisfying results. One important variable that must be considered in any decision, and is not easy to include in the typical analysis, is the effects of the decisions on the environment and human quality of life. In this course, attempts are made a addressing these concerns.

- II. The major emphasis of this course is to learn how to use procedures that will assist in decision-making in areas commonly encountered in the engineering profession. We will assume that the process used and the decision variables considered are rational - More profits are preferred to less; minimal costs are preferred to max costs; reliability and safety are desirable attributes; money costs something; and, the people supplying the engineering, accounting, economic, and other parameters are truthful. Decision-making is a skill as well as an art but there is a process that assists the decision maker hone his/her skills and then practice the art of effective decision-making. The author of your economics text has suggested a rational decision process that has eight basic steps. This procedure is suggested as a way to attack every problem. Included within these steps is a list of the things you wish to know as well as the things you do not know and we can begin defining and outlining the decision.