

## IENG377-001, CRN 13510 Engineering Economy

Spring Session 2015

MRB 113, 10:00 – 10:50 MWF

Number of Credit Hours: 3

**Prerequisite:** Engineering background or consent

**Instructor:** Dan Kniska

Email: [dan.kniska@cesd.wvu.edu](mailto:dan.kniska@cesd.wvu.edu) Phone: 304-692-9606 Office: 333A

Office Hours: By appointment

**Textbook:** Engineering Economic Analysis, 11<sup>th</sup> Edition – Newnan, Eschenbach, Lavelle---Oxford University Press

### **Course Objective:**

Engineering Economy provides a systematic framework for evaluating the economic aspects of competing design solutions.

In this course, the student will have understood the concepts of cash flow, cash flow equivalence, cash flow before taxes, depreciation and depletion, cash flows after taxes, profits, evaluation of alternatives, financial statements and to work on a multidisciplinary team project.

### **IMSE Designated Outcomes and Key Abilities for IENG 377:**

IMSE Outcome #1: Students will have acquired the ability to use modern and classical Industrial Engineering methodologies such as operations research, manufacturing systems, computer programming and simulation, production systems, human factors and ergonomics, engineering statistics and quality control, and **engineering economics**.

The designated key abilities for this course for the aforementioned outcome include an understanding of the following items:

1. Income Statement and Balance Sheet
2. Cash Flow Equivalence
3. Depreciation and Depletion
4. After Tax Economic Analysis
5. Evaluation of Multiple Alternatives

IMSE Outcome #4: Students will have acquired the ability to work individually, on teams and on multi-disciplinary teams to identify, formulate, and solve problems using industrial engineering knowledge, skills and tools.

The designated key ability for this course for the aforementioned outcome includes an understanding of the following items:

1. Work effectively in a multidisciplinary team.

**Course topics, chapters (Tentative):**

Week	Topic	Chapters
1	Intro to Economic Decisions, Costs Concepts	Ch 1, Ch 2
2	Cost estimation, Income statement and Balance Sheet	Ch 2, Ch 17
3-4	Economic Expressions and Equivalence—Time value of money, Equivalence for Repeated Cash Flows	Ch 3, Ch 4
5	Review, <b>Exam 1</b>	<b>Ch 1 – 4, 17</b>
6-7	Is a single investment a good investment? Choosing the best alternative. Present Worth, Annual Cash Flow, Future Worth, Rate of Return Analysis, Payback Period	Ch 5, 6, 7, 8, 9
8	Depreciation	Ch 11
9	Taxes	Ch 12
10	<b>Review, Exam 2</b>  Sensitivity and Breakeven	<b>Ch 5, 6, 7, 8, 9, 11, 12</b>  Ch 9
11	Spring Break	
12	Sensitivity and Breakeven , Inflation	Ch 9, 14
13	Inflation, Exchange Rates	Ch 14, Currency Lecture Notes
14	Capital Budgeting and Other topics	Chapter 10, 15, Lecture Notes
15	<b>Review, Exam 3</b>	<b>Ch 11, 12, 9, 14, 10, 15 and Exchange rates</b>
16	<b>Project Presentations</b>	

**Grading Scale:**

- **A = 90%-100%**
- **B = 80%-89%**
- **C = 70%-79%**
- **D = 60%-69%, F = 59% or less**

**Grading:**

- 3 Exams – 75%**
- Project – 15%**
- Quizzes and Turn in homework, 10%**
- Drop 1 lowest quiz/homework grade**

## **Project**

The engineering economy project is a group project that involves using engineering economy principles and techniques to solve an engineering management case. The case will reflect a multidisciplinary situation similar to those encountered by engineers within the first three to five years of their professional careers. Students will work on the project in groups of four to six members. Each team must contain members from at least two CEMR departments. Milestones for the project are listed below:

1. Submit a proposal package that includes the team name, team members.
2. Develop an Excel spreadsheet model to analyze multiple scenarios within the case.
3. Give a 10 minute PowerPoint presentation (described below) to explain the team's analysis and recommendations for the case. Each team member presents at least one Power Point slide.

Suggested Presentation Format will be handed out when project is given.

## **Academic Dishonesty**

Acts of academic dishonesty, such as cheating or plagiarism or assisting others in cheating, may result in a failing grade (F) and be reported to the department Chair.

## **Statement on Social Justice**

West Virginia University is committed to social justice. I concur with that commitment and expect to foster a nurturing learning environment based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration.

## **Statement on Disability Accommodation**

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with Disability Services (293-6700).

**Statement on Attendance:** If a student is absent without an acceptable excuse on the day of a quiz, the student will receive a zero on that quiz. If you must miss a scheduled exam, you must obtain prior approval from me unless you are incapable of calling, emailing, or otherwise getting in touch with me. Otherwise you will receive a zero on the test. Of course, I excuse absences due to sanctioned WVU events where your participation is required (e.g., as a member of a sport team or a meeting of a professional society).

**Prepared by: Dan Kniska    For: IENG, CEMR**