

## IENG377-002, CRN 82350 Engineering Economy

Fall Session 2018

Percival -E 334 12:30 – 1:45 Tuesday/Thursday

Number of Credit Hours: 3

**Prerequisite:** Engineering background or consent

**Instructor:** Dan Kniska

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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
3-4	Income statement and Balance Sheet, Economic Expressions and Equivalence—Time value of money, Equivalence for Repeated Cash Flows	Ch 17, Ch 3, Ch 4
5	Ch 4, Review for Exam 1	Ch 4
6	<b>Exam 1</b>	<b>Ch 1 – 4, 17</b>
6-7	Is a single investment a good investment? Choosing the best alternative.	Ch 5, 6, 7, 9
8	Choosing the best alternative. Depreciation	Ch 5, 6, 7, 9, 11
9-10	Depreciation, Taxes, Review	Ch 11,12
11	<b>Exam 2</b>	<b>Ch 5, 6, 7, 9, 11, 12</b>
11-12	Sensitivity and Breakeven , Inflation	Ch 9, 14
13	Inflation, Currency Exchange Rates, Capital Budgeting and Other topics	Ch. 14, Currency Lecture Notes, Ch 10, 15
14	Review, <b>Exam 3</b>	<b>Ch 5,6,7,9,11,12,14, Currency Rates, 10, 15</b>
15	Thanksgiving Break	
16	Project Presentations	
17	Project Presentations	

**Grading Scale:**

**Grading:**

- **A = 90%-100%**
  - **B = 80%-89%**
  - **C = 70%-79%**
  - **D = 60%-69%**
  - **F = 59% or less**
- 3 Exams – 75%**
  - Project – 15%**
  - Turn in homework, 10%**
  - Drop 1 lowest turn in 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**