

**DEPARTMENT OF INDUSTRIAL AND SYSTEMS ENGINEERING**  
**ISEN 302: ECONOMIC ANALYSIS OF ENGINEERING PROJECTS**

**REQUIRED or ELECTIVE:** required for some non-ISEN majors

**CATALOG DESCRIPTION** (2-0) Credit 2

Principles of economic equivalence; time value of money; analysis of single and multiple investments; comparison of alternatives; capital recovery and after-tax analysis of economic projects.

**PREREQUISITES**

MATH 152

**PROFESSIONAL COMPONENT**

This course introduces students to the effective use of economic analysis techniques and their application to the evaluation and selection of project alternatives.

**COURSE LEARNING OUTCOMES**

At the end of the course, students should be able to

- Choose and calculate the appropriate measure(s) of merit.
- Understand and use the time value of money concepts.
- Understand economic analysis techniques.
- Build spreadsheet models that will aid performing economic analysis.

**TEXTBOOK**

Basics of Engineering Economy; Leland Blank and Anthony Tarquin; McGraw-Hill, 2008; ISBN 978-0-07-340129-4.

**TOPICS COVERED**

| <b>Topic</b>  | <b>Chapter</b> |
|---|----------------|
| 1. Course Organization / Introduction               | 1.1 – 1.3      |
| 2. Foundations of Engineering Economy               | 1.4 – 1.9      |
| 3. Factors: How Time and Interest Affect Money      | 2.1 – 2.5      |
| 4. Nominal and Effective Interest Rates             | 3.1 – 3.7      |
| 5. Present Worth Analysis                           | 4.1 – 4.6      |
| 6. Annual Worth Analysis                            | 5.1 – 5.4      |
| 7. Rate of Return Analysis                          | 6.1 – 6.8      |
| 8. Benefit/Cost Analysis and Public Sector Projects | 7.1 – 7.4      |
| 9. Effects of Inflation                             | 10.1 – 10.5    |
| 10. Depreciation Methods                            | 12.1 – 12.7    |

**CLASS AND LAB SCHEDULE**

Two days a week, 50 minutes per day. No laboratory component.

**CONTRIBUTION TO MEETING REQUIREMENTS OF CRITERION 5:**

| Subject       | Semester hrs | Subject             | Semester hrs | Subject | Semester hrs |
|---------------|--------------|---------------------|--------------|---------|--------------|
| Mathematics   |              | Engineering Science | 2            | General |              |
| Basic Science |              | Engineering Design  |              |         |              |

**RELATIONSHIP OF COURSE TO PROGRAM OUTCOMES:**

|   | ABET Program Outcome  |   | ABET Program Outcome  |
|---|---|---|---|
| x | a. ability to apply knowledge of mathematics, science and engineering   |   | f. understanding of professional and ethical responsibility   |
|   | b. ability to design and construct experiments, as well as to analyze and interpret data  |   | g. ability to communicate effectively   |
|   | c. ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability |   | h. broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context |
|   | d. ability to function on multi-disciplinary teams  |   | i. recognition of the need for, and an ability to engage in life-long learning  |
| x | e. ability to identify, formulate and solve engineering problems  |   | j. a knowledge of contemporary issues   |
|   |   | x | k. ability to use the techniques, skills and modern engineering tools necessary for engineering practice                                  |

**PREPARED BY:** Don Smith

**Date** April 7, 2010