

1. *Course number and name*
ENGR 610: Engineering Cost Analysis

2. *Credits and contact hours*
3 credit hours; three 50-minute lecture sessions/week, or two 1hr-15-minute lecture sessions/week, depending on semester

3. *Instructor's or course coordinator's name*
Instructor: Mutlu Ozer, Adjunct Professor
Course coordinator: Ghassan Tarakji, Professor of Civil Engineering

4. *Text book, title, author, and year*
Newman, D. G., Lavelle, J. P., and Eschenback, T.G., Engineering Cost Analysis, 10th Ed.. Oxford: New York 2009.
 - a. *other supplemental materials*
none

5. *Specific course information*
 - a. *brief description of the content of the course (catalog description)*
Quantifying alternatives for decision making, time-value of money, project investment evaluation, comparison of alternatives, and engineering practice applications.

 - b. *prerequisites or co-requisites*
ENGR 103: Introduction to Computers or CSC 210: Introduction to Computer Programming
Math 227: Calculus II (Techniques of integration, analytic geometry, polar coordinates, vectors, improper integrals. Sequences and series.)

 - c. *indicate whether a required, elective, or selected elective course in the program*
Elective for Civil, Mechanical, and Electrical Engineering

6. *Specific goals for the course*
 - a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*
 - The student will demonstrate an understanding of interest formulas and their application.
 - The student is able to apply the principles of rate of return (ROR), incremental ROR, benefit/cost ratios (B/C), incremental B/C, and replacement analysis in order to compare alternatives for decision making.
 - The student is able to identify and quantify variables, and formulate problems for decision making.
 - The student will demonstrate the ability to determine how deviations from the assumptions used in solving a problem will affect the conclusions obtained.
 - The student will demonstrate an understanding of inflation and how to take it into account when doing economic analysis.
 - The student will demonstrate an understanding of the common depreciation models used, and the ability to apply these models in practical cases.

- The student will demonstrate the ability to calculate corporate taxes, and to calculate after-tax returns.

b. *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

Course addresses ABET Student Outcome(s): a, c, e, h, j

7. *Brief list of topics to be covered*

- Quantifying costs and benefits
- Interest formulas and their application
- Rate of return computations
- Comparison of alternatives
- Benefit/Cost ratio
- Replacement analysis
- Inflation
- Taxation and after-tax cash-flow
- Break-Even analysis
- Review and case studies