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, Instructor  
   Course coordinator: Ghassan Tarakji, Professor of Civil Engineering

4. **Text book, title, author, and year**  

   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, engineering practice applications, and introduction to value engineering.

   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.

The student will demonstrate a basic understanding of value engineering and how such studies can be commissioned.

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, e, c, 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
- Fundamentals of value engineering