Template for ABET course syllabi (new format)

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*
   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, 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