



Course Description

ETI2670 | Engineering Economic Analysis | 3.00 credits

This course is designed for students who are majoring in any engineering discipline. Students will learn the basic methods of engineering cost analysis including equivalence, value measurement, interest relationships and decision support theory and techniques as applied to capital projects. Various problem-solving methods will be used for decision making, multiple alternatives and uncertainty. Prerequisite: MAC1105.

Course Competencies

Competency 1: The student will demonstrate an understanding of analysis of cost elements in technical operations and the cost-analysis decisions that affect engineering projects by:

1. Using the internet to locate pertinent information and assembling relevant data
2. Analyzing the cost requirements given to a specific engineering project
3. Comparing the cost impact of alternative designs and/or projects
4. Identifying the criteria to determine the most profitable alternative

Competency 2: The student will demonstrate an understanding of how to evaluate technical projects by:

1. Analyzing complex and simple spreadsheets containing information about specific projects
2. Calculating interest, labor force costs, down time and overhead involved given a specific engineering project
3. Evaluating equivalence of economic decisions and the impact on system design
4. Computing cash flow through receipts or disbursements at different points in the engineering project cycle
5. Using financial analysis techniques and methods to make decisions about cost-effective approaches to research, development, and implementation of engineering projects

Competency 3: The student will demonstrate the ability to use financial functions to conduct engineering project cost analysis by:

1. Computing the impact of various types of interest on engineering cost analysis decisions, including nominal, effective, etc.
2. Calculating simple interest and compound interest amounts
3. Analyzing continuous compounding to evaluate increases and decreases in duration periods
4. Allocating expenses to appropriate budget accounts

Competency 4: The student will employ methods of cost analysis to evaluate project alternatives by:

1. Selecting an appropriate analysis method to determine specific economic parameters of a project
2. Calculating and analyzing the impact of various costs associated with engineering projects including repairs, defects and warranties
3. Calculating purchasing expenses and evaluating their impact on the engineering project
4. Analyzing the impact of downtime on project decisions
5. Calculating present worth analysis and future worth analysis to establish project specifications
6. Preparing a benefit-cost analysis with benefit-cost graphs
7. Computing the rate of return on project investments
8. Computing the initial capital investment on equipment and the pay-back period for investments

Competency 5: The student will demonstrate an understanding of Money-time relationships and equivalence by:

1. Explaining the key concepts of equivalence
2. Using and applying equivalence calculations involving multiple interest formulas
3. Utilizing interest formulas to determine various types of cash flows
4. Calculating both nominal and effective interest rates and applying them to various projects

5. Defining, calculating, and explaining how the following impact engineering system projects including production depreciation, cost depletion and percentage depletion

Competency 6: The student will demonstrate an understanding of the impact of taxes on engineering projects by:

1. Discussing the types of taxes that impact the labor, materials, facilities, permits, and licenses that comprise engineering projects
2. Identifying and interpreting the correct tax tables for specific expenditures
3. Determining taxable income and after cash flow
4. Creating spreadsheets and tables analyzing project costs
5. Calculating solutions that include marginal tax data associated with keeping assets
6. Describing the differences between marginal costs and data defender costs

Competency 7: The student will demonstrate an understanding of the key concepts used to determine costs and benefits of an engineering project by:

1. Determining minimum production costs and life problem costs
2. Utilizing the methods and techniques to establish the basis sign procedure
3. Computing problems relating to inflation and deflation using the basis of goods and services
4. Using replacement analysis techniques to determine the impact of replacing a system
5. Preparing and presenting an economic impact report to justify a project

Competency 8: The student will demonstrate an understanding of risk and uncertainty in managing engineering projects by:

1. Defining risk, uncertainty and sensitivity
2. Identifying the factors that affect uncertainty involved in engineering projects
3. Applying sensitivity analysis to engineering projects
4. Applying the break even analysis method to determine potential risk in projects

Learning Outcomes:

- Use quantitative analytical skills to evaluate and process numerical data
- Formulate strategies to locate, evaluate, and apply information
- Use computer and emerging technologies effectively