Miami Dade College

Course Description

ETI3671 | Technical Economic Analysis | 3.00 credits

This course is designed to cover the formulation and application of analytical techniques to reach cost effective solutions to engineering problems. Students will learn time based analysis of selection, replacement, and lease-or-buy decisions including multiple alternatives, uncertainty, and sensitivity analysis, using a problem-solving approach. Prerequisite: MAC 1105.

Course Competencies

Competency 1: The student will demonstrate an understanding of how economic decisions affect engineering projects by:

1. Analyzing pertinent information and assembling relevant data
2. Analyzing the economic requirements given a specific engineering project
3. Comparing the economic impact of alternative designs when creating system models
4. Establishing criteria to determine the best alternative

Competency 2: The student will demonstrate the ability to calculate the expenses involved in the development and implementation of engineering systems 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 economical 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 economic analysis by:

1. Computing the impact of various types of interest on engineering economic decisions, including nominal, effective, uniform series, etc.
2. Calculating compound amount, net present worth
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 economic analysis to evaluate project alternatives by:

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

Competency 5: The student will demonstrate an understanding of basic and complex obsolescence and depreciation of engineered systems by:

1. Calculating the costs of depreciating assets in an engineering project
2. Differentiating between straight line and double line depreciation and discussing the appropriate application of each type
3. Defining, calculating, and explaining how the following impact engineering system projects including: production

depreciation depletion cost depletion percentage depletion double declining balance

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

1. Discussing the types of taxes that impact the labor, materials, facilities, permits, licenses, etc. that comprise engineering projects
2. Locating the correct tax tables and interpreting 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 by:

1. Determining minimum production machinery 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 economic impact of replacing a system
5. Preparing and presenting an economic impact report to justify a project

Learning Outcomes

- Use quantitative analytical skills to evaluate and process numerical data
- Solve problems using critical and creative thinking and scientific reasoning
- Formulate strategies to locate, evaluate, and apply information