

MET-2422: FUNDAMENTALS OF ENGINEERING ECONOMICS

Cuyahoga Community College

Viewing: MET-2422 : Fundamentals of Engineering Economics

Board of Trustees:

2016-03-31

Academic Term:

Fall 2020

Subject Code

MET - Mech Eng/Manuf Ind Eng Tech

Course Number:

2422

Title:

Fundamentals of Engineering Economics

Catalog Description:

Analysis of cost elements in engineering projects and operations. Topics include: comparison of project alternatives; selecting an alternative by applying Benefit/Cost Analysis, Present Worth Method, Annual Worth Method, and Internal Rate of Return; introduction to risk analysis, accounting fundamentals, financial statements, and capital financing and allocation. Ethical and social responsibilities as applied to engineering project decisions. Practical applications of cost concepts and the application towards the different phases of manufacturing or project implementation. Use of Microsoft Excel in performing analysis.

Credit Hour(s):

3

Lecture Hour(s):

3

Requisites

Prerequisite and Corequisite

MATH-1530 College Algebra or higher.

Outcomes

Course Outcome(s):

Apply the principles of Engineering Economics in planning and acquisition of engineering resources

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. Explain Benefit/cost Ratio Evaluation Methods
2. Plan and conduct cost analysis of given project options
3. Perform time value of money and cash flow analysis
4. Determine the depreciation values of capital resources and taxes
5. Conduct Benefit/cost Ratio evaluations
6. Analyze project uncertainty using sensitivity analysis and Monte Carlo simulations
7. Perform Engineering Economics Analysis Using Microsoft Excel
8. Explain ethical and social responsibilities as applied to project decisions.

Methods of Evaluation:

1. Exams and quizzes
2. Reports and Projects

Course Content Outline:

1. Understanding Money and its Management
 - a. Engineering Economic Decisions
 - b. Financial Mathematics
 - c. Understanding Money Management
 - d. Managing Money under Inflation
2. Evaluating Business and Engineering Assets
 - a. Present Worth Analysis
 - b. Annual Equivalence Analysis
 - c. Rate of Return Analysis
3. Development of project cash flows
 - a. Accounting for Depreciation and Income Taxes
 - b. Project Cash Flow Analysis
 - c. Handling Project Uncertainty
4. Handling Project Uncertainty
 - a. Sensitivity Analysis
 - b. Adjusting for Risk
 - c. Introduction to Monte Carlo Simulations
5. Special Topics in Engineering Economics
 - a. Replacement Decisions
 - b. Benefit-Cost Analysis
 - c. Accounting Fundamentals
 - d. Understanding Financial Statements
 - e. Using Microsoft Excel in Solving Engineering Economics Problems
 - f. Introduction to Capital Financing and Allocation
6. Ethical and Social Responsibilities as apply to project decisions

Resources

Park, Chan. *Contemporary Engineering Economics*. 6th Ed. Upper Saddle River, NJ.:Prentice Hall, 2016.

Quirk, Michael. *Manufacturing Teams and Improvement: The Human Art of Manufacturing*. Upper Saddle River, NJ.:Prentice Hall, 1999.

Meyers, Fred and James Stewart. *Motion and Time Study for Lean Manufacturing*. 3rd Ed. Upper Saddle River, NJ.:Prentice Hall, 2002.

Meyers, Fred and Matthew Stephens. *Manufacturing Facilities Design and Material Handling*. 5th Ed. Upper Saddle River, NJ.:Prentice Hall, 2013.

Park, Chan. *Fundamentals of Engineering Economics*. 3rd Ed. Upper Saddle River, NJ.:Prentice Hall, 2013.

Garcia-Diaz, Alberto Smith, J. MacGregor. *Facilities Planning and Design*. Upper Saddle River, NJ.:Prentice Hall, 2008.

Sullivan, W. and Elin Wicks. *Engineering Economy*. 15th. Boston: Prentice Hall, 2012.

Instructional Services

OAN Number:

Transfer Assurance Guide OES005

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Key: 2923