ISYE 3025 ESSENTIALS OF ENGINEERING ECONOMY

Credit: 1-0-1

Prepared Prof. Gebraeel, Spring 2012

Prerequisite(s):

Catalog Description:
Methods of economic analysis in engineering, including time value of money, equivalence, economic measures of worth, selection rules for alternatives, income taxes and equipment depreciation, inflation, and uncertainty.

Text:
Materials provided on the T-square web site for GT students:
https://t-square.gatech.edu/portal

Video Streams:
http://www.isye.gatech.edu/engecon/lectures.php

Objective
To enable the student to characterize the cash flows associated with engineering projects and evaluate them from the viewpoint of after-tax-cash flows.

Topical Outline
1. Financial Mathematics: Concept of Equivalence; Equivalence Formulas; Interest Rates.
2. Economic Decision Criteria. Fundamentals of Economic Decisions, Future, Present, and Annual Worth, Internal Rate of Return, Benefit/Cost Ratio and Payback Period.
3. Multiple Alternatives.
4. Taxes: Corporate Income Taxes, Depreciation Accounting, Sale of and Asset, Financing with a Loan.
5. Inflation and Uncertainty.

Outcomes
At the end of this course, students will be able to:
- Manipulate cash flows to obtain equivalent values for a different time point or time frame.
- Understand engineering economic decision criteria, including net present value, internal rate of return, and benefit cost ratio.
- Form alternatives and derive valid cost/benefit estimations from available data.
- Compare alternatives having unequal economic lives.
- Perform after tax cash flow analysis, applying standard depreciation accounting rules.
- Reflect inflation and uncertainty in analyses.

Program outcomes Course outcomes	a. apply math	b. data analysis	c. IE method	d. teamwork	e. problem solving	f. prof/ and ethical responsibilities	g. communication	h. global, eco, envi and soc context	i. continue to improve	j. current issues	k. participate in an organization
Ability to manipulate cash flows to obtain equivalent values for a different time point or time frame	H	M			L						
Ability to understand engineering economic decision criteria, including net present value, internal rate of return, and benefit cost ratio	M	M	H		H						
Ability to form alternatives and derive valid cost/benefit estimations from available data	M	H	H		H						
Ability to compare alternatives having unequal economic lives	M	H	H		H						
Ability to perform after tax cash flow analysis, applying standard depreciation accounting rules	L	M	H		L			L			
Ability to reflect inflation and uncertainty in analyses	M	M	M		M						
Ability to learn concepts using video streams									H		

Evaluation of important outcomes

The following outcomes will be assessed through the course exams:

1. Ability to apply engineering economic decision criteria to situations that require equivalence transformations on cash flows.
2. Ability to identify tax-deductible expenses, obtain profit after tax, and obtain cash flow after taxes, interest, and principal.
3. Ability to perform breakeven and expected value analysis using engineering economic decision criteria.