ISYE 3025 ESSENTIALS OF ENGINEERING ECONOMY

Required for BSIE

Credit: 1-0-1

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Prerequisite(s): None.

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 Canvas web site for GT students: https://gatech.instructure.com/

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

Topic	Weeks
Concept of Equivalence; Equivalence Formulas; Interest Rates.	3
Fundamentals of Economic Decisions, Future, Present, and Annual Worth, Internal Rate of Return, Benefit/Cost Ratio and Payback Period.	5
Financial Alternatives.	2
Corporate Income Taxes, Depreciation Accounting, Sale of an Asset, Financing with a Loan.	3
Inflation and Uncertainty.	1
Total	**14**

Outcomes
At the end of this course, students will be able to:

1. Manipulate cash flows to obtain equivalent values for a different time point or time frame.
2. Understand engineering economic decision criteria, including net present value, internal rate of return, and benefit cost ratio.
3. Form alternatives and derive valid cost/benefit estimations from available data.
4. Compare alternatives having unequal economic lives.
5. Perform after tax cash flow analysis, applying standard depreciation accounting rules.
6. Reflect inflation and uncertainty in analyses.

Course outcome \ Program Outcomes	1. identify, formulate solve engg prob by engg, sci & Math	2. produce solutions consider public health, safety, welfare, global, cultural, social, environ & economic	3 communicate with a range of audience	4 recognize ethical & professional responsibilities, make informed judgement consider resolutions in global, economic, environ and societal context.	5. effective on a team provide leadership, collaborative and inclusive envirn, plan tasks & meet objectives	6. develop and conduct experiment, analyze and interpret data & use engineering judgement to draw conclusions.	7. acquire and apply new knowledge using appropriate learning strategies
1. Manipulate cash flow to obtain equivalent values		H					
2. Understand economic decision criteria, present value, IRR, benefit/cost ratio							
3. Form alternatives and derive cost/benefit estimates							
4. Compare alternatives with unequal economic lives		H					
5. Perform after tax cash flow, apply depreciation accounting rules		H					
6. Reflect inflation and uncertainty in analysis.							

Evaluation of the important outcomes

- H will be assessed by direct questions on exams

The final exam will include a verbal, comprehensive problem asking students to compare two alternatives involving depreciation and taxes.