

ECE 472S Course Objective and Course Content Spring, 2021

Course Objective:

Economic evaluation & justification of engineering projects and investment proposals.

Course Content:

Week 1 - Introduction

- Engineering economics definition
- Time value of money
- Cash flow approach

Week 1/2 - Cost Concepts

- Life-cycle costs
- Direct, indirect and overhead costs
- Average and marginal costs

Week 3 - Corporate Finance

- Sources of funding in the capital markets
- Debt, equity and the cost of capital
- Risk management and the optimal capital structure

Week 4/5 - Basic Accounting Principles

- Income Statement
- Balance Sheet
- Financial ratios/indicators

Week 6/7 - Time Value of Money Operations

- Interest rates
- Present/future value calculations
- Series of cash flows
- Equivalence

Week 8/9 - Comparison of Alternatives I – Private Sector

- no taxes – perfect certainty
- project evaluation on a cash-flow basis
- financial comparison of technical alternatives

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Course Content (cont'd):

Week 10/11 - Income Tax & Engineering Projects

- Personal/corporate income tax
- Depreciation/Capital Cost Allowance
- Income tax incentives

Week 10/11 - Comparison of Alternatives II – Private Sector

- Income tax impact on engineering projects
- Net operating cash flow statements
- Project evaluation on an after-tax basis

Week 12 - Comparison of Alternatives III – Public Sector Projects

- Cost-benefit analysis of government projects
- Cost-effectiveness analysis
- Value of a Statistical Life in engineering decisions

Week 13 - Decisions Under Conditions of Uncertainty

- Account for the element of risk in projects
- Descriptive models
 - Break-even and sensitivity analysis