

**School of Engineering  
University of Guelph**

**ENGG\*3240 Engineering Economics  
Course Description & Outlines - Fall 2007**

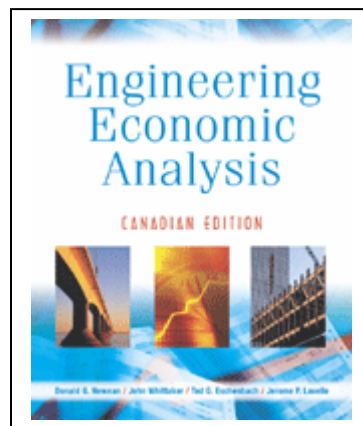
**CALENDER DESCRIPTION**

Principle of project evaluation, analysis of capital and operating costs of engineering alternatives, benefit-cost ratio, break even studies, evaluation recognizing risk, replacement and retirement of assets, tax consideration, influence of sources of funds.

**TEXT BOOK**

Title: Engineering Economic Analysis, Canadian Edition  
Author: Donald Newnan, John Whittaker,  
Ted Eschenbach, and Jerome Lavelle  
ISBN: 0-19-541925-1

University of Guelph Bookstore Website



**INSTRUCTOR**

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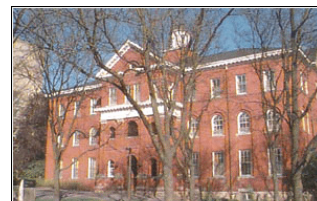
Albert A. Thornbrough  
Building

**TEACHING ASSISTANTS**

TBA  
Office: Room TBA, Thornborough Building  
Email: TBA

**LECTURE TIMES & LOCATION**

Tuesday 7:00-8:20pm MCLN 102  
Thursday 7:00-8:20pm MCLN 102



Maclachlan=MCLN

**OFFICE HOURS**

Wednesday 9:00- 12:00 am, THORN1383

Or by appointment

**COURSE OBJECTIVES:**

This course deals with economic analysis and evaluation of engineering projects. The concepts in engineering economics are also important in the process of planning, design and implementation of engineering systems. It involves quantification of benefits and costs associated with engineering projects in order to determine their economic and financial feasibility, and choose among project alternatives. Specific objectives of the course are to

- develop skills in the evaluation of alternative capital investments,
- master how to deal with inflation, taxes, depreciation and uncertainty,
- learn problem solving techniques involving economic evaluations,
- familiarize with current national and international economic challenges related to investment projects and expansion of business operations, and
- assess risks and uncertainty associated with engineering economic decisions.

**MARK DISTRIBUTION:**

Assignments:	30%
Research Report	10%
Midterm	25%
Final Examination:	35%
	100%

**MID-TERM and FINAL EXAMINATION****MID-TERM**

Date: October 25, 2007. Time: 7:00 – 8.20 pm, chapter 1 to 8.

Location: MCLN 102

**FINAL**

Date: December XX, 2007

Time: To be announced

Location: To be announced

## **ASSIGNMENTS**

There will be 6 assignments. Each assignment is worth 5% and together they contribute 30% to your final grade. Due dates will be listed on the WebCT. All assignments must be completed and submitted electronically, on time for the student to be successful in the course.

## **COURSE MATERIAL TO BE COVERED**

### **Chapter 1 Making Economic Decisions**

- The role and purpose of engineering economic analysis
- The economic decision-making process

### **. Chapter 2 Engineering Costs and Cost Estimating**

- Cost concepts and engineering cost estimating
- Cost and benefit
- Cash flow diagram

### **Chapter 3, Chapter 4 Interest and Equivalence**

- Simple and compound interest
- Equivalence concepts
- Uniform series (present worth and future worth)
- Uniform payment series (sinking fund factor and capital recovery factor)
- Nominal and effective interest rates

### **Chapter 5 Present Worth Analysis**

- The present worth (PW) criteria
- Present worth (PW) comparison
- PW in cases with equal, unequal and infinite lives

### **Chapter 6 Annual Cash Flow Analysis**

- Equivalent uniform annual costs (EUAC) and equivalent uniform annual benefits (EUAB)
- Annual worth analysis
- Loan Amortization

### **Chapter 7 and Chapter 8 Rate of Return Analysis (ROR)**

- Internal rate of return (IRR)
- Minimum acceptable rate of return (MARR)
- Multiple IRR
- Incremental Analysis

### Chapter 9 **Other Analysis Techniques**

- Future worth analysis
- Benefit-cost ratio analysis
- Payback period
- Sensitivity and breakeven analyses.

### Chapter 10 **Uncertainty in Future Events**

- Probability and risk
- Joint probability distributions
- Expected value
- Decision tree analysis procedure
- Sample and population statistics
- Monte Carlo simulation (e.g. NPW, IRR...)

### Chapter 11 and Chapter 12 **Income, Depreciation, and Cash Flow**

- Basic aspects of depreciation
- Causes of depreciation
- Depreciation for tax purposes
- Depreciation and asset disposal
- Taxation and capital cost allowance
- Impact of taxes on decisions
- Accounting and engineering economy: after-tax cash flow

### Chapter 13 **Replacement Analysis Economic Life**

### Chapter 14 **Inflation and Price Change**

- Real and actual dollars and interest rates
- Impact of inflation decision

## **UNIVERSITY POLICY ON ACADEMIC MISCONDUCT**

Academic misconduct, such as plagiarism, is a serious offence at the University of Guelph. Please consult the Undergraduate Calendar and School of Engineering programs guide, for offences, penalties and procedures relating to academic misconduct.

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>