A POLYTECHNIC INSTITUTION

Course Outline

School of Manufacturing, Electronics, and Industrial Processes
Program: Bachelor of Technology in Electronics
Service Provided by: School of Business

FMGT 8295
Engineering Economics

Start Date: April **End Date:** June

Total Hours: 45 **Total Weeks:** 7.5 **Term/Level:** **Course Credits:** 3
Hours/Week: 6 **Lecture:** 6 **Lab:** **Shop:** **Seminar:** **Other:**

Prerequisites
Course No. **Course Name**

FMGT 8295 is a Prerequisite for:
Course No. **Course Name**

Course Description (required – MUST be from BCIT web - course descriptions)

This course is meant to provide the practicing engineer with the financial knowledge and skills required for the economic analysis of business situations; more specifically the costs and benefits of alternative solutions to technical problems. This course covers the syllabus material for the CCPE Engineering Economics exam.

Detailed Course Description (optional – more detailed description provided by Instructor)

Evaluation

Weekly Assignments	25	%	Comments: Minimum passing grade for this course is 50%.
Mid Term	25	%	
Final Exam	50	%	
TOTAL	**100**	%	

Course Learning Outcomes/Competencies

Upon successful completion of the course, the student will be able to:

1. Understand and perform basic analysis of financial statements.
2. Explain and apply the various cost classifications used in economic analysis.
3. Perform time value of money calculations including loan amortization, effective interest rate calculations and the valuation of stocks and bonds.
4. Perform capital budgeting analyses using present value, future value, equivalent annual worth and rate of return approaches.
5. Incorporate depreciation (CCA), income taxes and inflation into the capital budgeting analyses.
6. Perform capital budgeting analyses in special cases such as replacements and public projects.
7. Incorporate uncertainty into capital budgeting analyses by such means as sensitivity, break-even and risk analysis.

Detailed course learning outcomes are given along with the schedule on pages 4 to 7.

■ Verification

I verify that the content of this course outline is current.

Authoring Instructor — Date: March 8/06

I verify that this course outline has been reviewed.

Program Head/Chief Instructor — Date: 28 March, 2006

I verify that this course outline complies with BCIT policy.

Dean/Associate Dean — Date: Mar 13/06

Note: Should changes be required to the content of this course outline, students will be given reasonable notice.

Instructor(s)

Rick McCallum | Office Location: SE6 381 | Office Hrs.: TBA | Office Phone: (604) 456 8171 | E-mail Address: rick_mccallum@bcit.ca

Learning Resources

Required:

Engineering Economics, Second Canadian Edition, by James L. Riggs, David D. Bedworth, Sabah U. Randhawa, Ata M. Khan

ISBN 0-07-094518-7, McGraw-Hill Ryerson Limited Publishers

Recommended:

Accounting for Non-Financial Managers, by John Parkinson

ISBN 1-55322-057-9, Captus Press Inc. Publishers

Information for Students

(*Information below can be adapted and supplemented as necessary.*)

Assignments: Late assignments, lab reports or projects will **not** be accepted for marking. Assignments must be done on an individual basis unless otherwise specified by the instructor.

Makeup Tests, Exams or Quizzes: There will be **no** makeup tests, exams or quizzes. If you miss a test, exam or quiz, you will receive zero marks. Exceptions may be made for **documented** medical reasons or extenuating circumstances. In such a case, it is the responsibility of the student to inform the instructor **immediately**.

Ethics: BCIT assumes that all students attending the Institute will follow a high standard of ethics. Incidents of cheating or plagiarism may, therefore, result in a grade of zero for the assignment, quiz, test, exam, or project for all parties involved and/or expulsion from the course.

Attendance: The attendance policy as outlined in the current BCIT Calendar will be enforced. Attendance will be taken at the beginning of each session. Students not present at that time will be recorded as absent.

Illness: A doctor's note is required for any illness causing you to miss assignments, quizzes, tests, projects, or exam. At the discretion of the instructor, you may complete the work missed or have the work prorated.

Attempts: Students must successfully complete a course within a maximum of three attempts at the course. Students with two attempts in a single course will be allowed to repeat the course only upon special written permission from the Associate Dean. Students who have not successfully completed a course within three attempts will not be eligible to graduate from the appropriate program.

Course Outline Changes: The material or schedule specified in this course outline may be changed by the instructor. If changes are required, they will be announced in class.

Assignment Details

Weekly assignments. See page 8 for details. These will be due at the start of the class following the class in which the material was covered. If a student is unable to attend a class the assignment should be e-mailed to the instructor

Schedule

Week Number	Outcome/Material Covered	Reference/ Reading	Course Learning Outcomes *(be able to)*
1	Introduction to Engineering Finance The Basics of Financial Accounting	Chapter 1 Handout	• Argue why a firm grounding in engineering finance is necessary for the engineering decision maker • Describe the 3 main financial statements • List and explain the main elements of an income statement and balance sheet • Demonstrate the interrelationship between the income statement and balance sheet and how business transactions affect both • Calculate corporate income tax in simple situations • Calculate cash flow • Calculate 8 financial ratios used to measure the financial health of a business
2	The Basics of Management Accounting	Handout	• Explain the various cost classifications (fixed, variable, sunk, direct, relevant, overhead) • Use these basic cost concepts in decision making such as: – Breakeven analysis – Make or buy – Drop a product – ?
3	Math of Finance for Engineers	Chapter 2 Handout	• Locate the five main TVM keys on the Sharp 733A calculator • Perform compounding operations for lump sums and annuities • Perform discounting operations for lump sums and annuities • Solve future sum, loan amortization and unknown interest rate type problems • Calculate bond values and yields • Calculate common stock values • Perform calculations (eg effective annual interest rates) when the compounding occurs more frequently than once a year
4	The Basics of Corporate Finance	Handout	• Describe the goal of a business enterprise and thus of Financial Management • Describe the functioning of the capital markets • Describe the various sources of financing available to a business enterprise and the advantages and disadvantages of each • Describe the features of long-term debt and equity financing

Week Number	Outline/Material Covered	Reference Reading	Course Learning Outcomes (be able to)
			• Calculate the cost of the individual sources of funds and combine these into an overall cost of capital for a business • Describe how a company determines its optimal capital structure • Relate the financial role of financial management to the asset management role
5	Capital Budgeting – Present/Future Worth; Equivalent Annual Worth	Chapters 3 & 4	• Compute and use present-worth comparisons • Compare alternatives with unequal lives, infinite lives, … • Compute and use future-worth comparisons • Perform bond and stock valuation calculations • Compute and use the equivalent annual-worth comparison method • Describe situations where it is appropriate to use equivalent annual-worth comparisons
6	Capital Budgeting – Rate-of-Return Calculations; Structural Analysis of Alternatives	Chapters 5 & 6	• Define and determine the minimum acceptable rate of return (MARR) • Calculate the Internal Rate of Return (IRR) of an investment proposal • Understand and overcome difficulties which occur when using IRR to rank investment proposals • Identify and classify investment alternatives and then analyze them using the most appropriate method (present worth, annual net worth, IRR)
7	Capital Budgeting – Replacement Analysis	Chapter 7	• Understand the fundamentals and terminology of replacement analysis • Perform a replacement analysis between a defender and the best challenger • Determine the economic service life for cyclic replacements • Address the complexities that arise in replacement analyses • Perform a lease versus buy analysis
8	Mid-term Exam		
9	Analysis of Public Projects	Chapter 8	• Identify fundamental differences between private and public sector projects • Use Benefit/Cost analysis to evaluate single projects and multiple alternatives • Identify and overcome irregularities when using benefit/cost comparisons

Week Number	Outcome/Material Covered	Reference/ Reading	Course Learning Outcomes (be able to)
			• Use Cost Effectiveness when evaluating public sector projects
10	Depreciation and Income Tax Considerations	Chapter 9	• Understand and correctly use the terminology of depreciation and income taxation • Use the various methods for computing depreciation charges and illustrate the effect of each on accounting income • Calculate corporate income taxes in a simple situation • Calculate capital cost allowance and show the effect of CCA on the income taxes paid by a corporation • Understand the concept of a tax shield and be able to perform associated calculations • Incorporate taxes and tax shields into economic analyses and convert the before-tax analyses seen in previous chapters into after-tax analyses
11	Effects of Inflation	Chapter 10	• Discuss the causes and economic implications of inflation • Account for inflation by using real dollars and inflation adjusted interest rates in a before-tax analysis • Account for inflation by using actual dollars and interest rates in an after-tax analysis • Know when and how to consider inflation in an economic evaluation
12	Uncertainty – Sensitivity Analysis	Chapter 11	• Understand the different approaches to decision making under certainty and under risk • Conduct a single-parameter sensitivity study • Conduct a multiple-parameter sensitivity study • Use the concepts of life-cycle costing and post-completion audits to improve the investment selection process for an organization
13	Uncertainty – Break-even Analysis And Risk Analysis	Chapters 12 & 13	• Understand and apply the basic principles of cost-profit-volume analysis to arrive at a breakeven point for a single project • Construct a break-even chart • Calculate breakeven points for multiple

Week Number	Outcome/ Material Covered	Reference/ Reading	Course Learning Outcomes (Be able to)
			alternatives • Perform a make or buy analysis • Recognize risk and know when and how to incorporate risk in an economic analysis • Calculate and apply probability measures and concepts • Calculate the value of perfect information • Use Monte Carlo simulation in economic analysis
14	Review for exam		
15	Final Exam		

Week Number	Assignment Due
1	*No assignment*
2	*There will be a problem set due each week*
3	
etc	