TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI

VICTORIA
UNIVERSITY OF WELLINGTON

School of Economics and Finance

QUAN 111
MATHEMATICS FOR ECONOMICS AND FINANCE

Trimester 2 2012

COURSE OUTLINE

Names and Contact Details

Lecturer/Coordinator: Mohammed Khaled (lecturing weeks 1-5, 12)
Email: mohammed.khaled@vuw.ac.nz
Office: RH322
Phone: 463-5787
Office Hours: Monday and Wednesday 9.00am-10.00am in EA119 or by appointment in RH322.

Lecturer: Jacek Krawczyk (lecturing weeks 6-11)
Email: jacek.krawczyk@vuw.ac.nz
Office: RH325
Phone: 463-5352
Office Hours: Monday and Wednesday 9.00am-10.00am in EA119 or by appointment in RH325.

Course Administrator: Francine McGee, RH319, 463-3818
    francine.mcgee@vuw.ac.nz

Trimester Dates
Teaching Period: Monday 16 July – Friday 19 October
Study Period: Monday 22 October – Thursday 25 October (Monday 22 October is a public holiday, Labour Day)
Examination Period: Friday 26 October – Saturday 17 November (inclusive)

Withdrawal from Course

1. Your fees will be refunded if you withdraw from this course on or before Friday 27 July 2012.

2. The standard last date for withdrawal from this course is Friday 28 September. After this date, students forced to withdraw by circumstances beyond their control must apply for permission on an *'Application for Associate Dean's Permission to Withdraw Late'* including supporting documentation

The application form is available from either of the Faculty's Student Customer Service Desks.

Class Times and Room Numbers
Lectures

(CRN 6469)	Mon and Wed	8.00 – 8.50	MCLT103
(CRN 6107)	Mon and Wed	10.00 – 10.50	SUMT228 (Monday)
			MCLT101 (Wednesday)

Tutorials
Besides the lectures, a total of eight 50-minute tutorials will be offered during the trimester according to the schedule appended on this outline. The available tutorial times and the signing in procedure will be notified through our course pages in the VUW website called 'Blackboard': http://www.blackboard.vuw.ac.nz.

Course Content
A brief outline of the course content, including an indicative schedule for the order of coverage, appears at the end of this course outline.

Course Learning Objectives
By the end of the course, students should be able to:
1. Carry out mathematical operations on numbers, sets and functions
2. Calculate rates of change using derivatives of functions
3. Find derivatives of functions of a single variable
4. Apply one-variable differentiation (derivatives, product and quotient rules, chain rule, second-order derivatives) to obtain local and global maxima and minima
5. Integrate a rate of change function to recover the function in levels
6. Employ partial differentiation to maximise or minimise functions of two or more variables
7. Represent variables as vectors and assess their linear dependence
8. Implement data operations using matrices
9. Solve linear equation systems using matrices, their determinants and inverses.

Course Delivery
The course is delivered by two weekly lectures and a total of eight tutorials during the trimester. Each tutorial is a small-group interactive problem solving session, usually covering the prior lecture material.

Expected Workload
You should expect to spend 2 hours in lectures per week, 8 hours in tutorials during the trimester, and about 10 hours per week reading, studying and completing assignments.

Readings
All students should have a copy of the textbook:

Penelope de Boer and Mohammed Khaled, *Mathematics for Business and Economics,* Pearson Prentice Hall, 2007, 2nd edition.

This book contains detailed notes on all of the topics covered in the course; no other textbook is necessary. The Lecture Schedule gives references to the textbook. Here are some optional alternative texts that you could consult. The books are ordered in increasing levels of advancement.

Ian Jacques, *Mathematics for Economics and Business*, 5th ed., FT-Prentice-Hall, 2006.

Michael Hoy et al., *Mathematics for Economics*, 2nd ed., The MIT Press, 2001.

Knut Sydsaeter and Peter Hammond, *Essential Mathematics for Economic Analysis*, 2nd ed., FT-Prentice-Hall, 2006.

Materials and Equipment

You must have a calculator that evaluates powers and logs. The recommended model is a modern Casio fx-82. Calculators will be essential for the test and final exam, however they must be silent in operation and have their own power source.

Assessment Requirements

Your performance will be evaluated on the basis of:

40% two 50-minute tests (CLO 1-5) and 60% 2-hour final exam (CLO 1-8), OR
100% 2-hour final exam (CLO 1-8), whichever is higher.

Test 1 is held in week 5 **(Wednesday 15 August)**, test 2 in week 10 **(Wednesday 3 October)** and the final exam in the examination period at the end of the trimester; exact times and rooms for the tests are to be announced later on the Blackboard website for the course.

If you are not able to sit the tests for any reason, the weight for the missed items will be added to that for the final exam, e.g. test 20% and exam 80%, if only one test is missed. We reserve the right to scale results if necessary to preserve comparability with other years.

A total of four assignments will also be due (by 3pm on a Monday) according to the appended schedule. You should use them as an indicator of your progress and performance. Since aegrotat decisions must be based on internal assessment prior to the final exam, it is important to have this evidence available by completing all assignments and the tests as best as you can, *in case you need to apply for an aegrotat pass*.

Assignments should be placed in the appropriate box (by tutor's name), located on Level 2 of Murphy. Do not give them to lecturers or tutors. Assignments will be graded either 0, 1 or 2. A zero grade is given for unsatisfactory work, a one is given for satisfactory work and a two is given for exceptional work. It is expected that most students will score a 1 for each assignment. Since the marks are indicative rather than quantitative, there is no need for a provision for remarking. Marks will be displayed weekly on Blackboard.

Quality Assurance Note
Your assessed work may also be used for quality assurance purposes, such as to assess the level of achievement of learning objectives as required for accreditation and audit purposes. The findings may be used to inform changes aimed at improving the quality of FCom programmes. All material used for such processes will be treated as confidential, and the outcome will not affect your grade for the course.

Examinations
Students who enrol in courses with examinations are obliged to attend an examination at the University at any time during the formal examination period.

The final examination for this course will be scheduled at some time during the period from Friday 26 October – Saturday 17 November (inclusive).

Mandatory Course Requirements
There are no mandatory course requirements.

Class Representative
A class representative will be elected in the first class, and that person's name and contact details made available to VUWSA, the Course Coordinator and the class. The class representative provides a communication channel to liaise with the Course Coordinator on behalf of students.

Communication of Additional Information
Additional information will be conveyed to students via Blackboard. Sometimes you will also be sent emails. These will be sent to the address that you supplied with your enrolment unless you advise otherwise.

For the following important information follow the links provided:

Academic Integrity and Plagiarism
http://www.victoria.ac.nz/home/study/plagiarism.aspx

General University Policies and Statutes
Find key dates, explanations of grades and other useful information at
www.victoria.ac.nz/home/study
Find out about academic progress and restricted enrolment at
http://www.victoria.ac.nz/home/study/academic-progress.aspx
The University's statutes and policies are available at www.victoria.ac.nz/home/about/policy,
except qualification statutes, which are available via the Calendar webpage at
http://www.victoria.ac.nz/home/study/calendar.aspx (See Section C).
Further information about the University's academic processes can be found on the website of the Assistant Vice-Chancellor (Academic) at
www.victoria.ac.nz/home/about_victoria/avcacademic/default.aspx

AVC (Academic) Website: information including: Conduct, Academic Grievances, Students with Impairments, Student Support
http://www.victoria.ac.nz/home/about_victoria/avcacademic/Publications.aspx

Faculty of Commerce Office
http://www.victoria.ac.nz/fcom/studenthelp/

Te Putahi Atawhai
Maori and Pacific Mentoring Programme
http://www.victoria.ac.nz/tpa/

LECTURE SCHEDULE

(Page numbers refer to the text, "Mathematics for Business and Economics" 2ⁿᵈ edn.)

Week 1 – Enrol in a Tutorial this week   **Pages**
L.1   Numbers, Number Operations, Simplifying Expressions   1-16
L.2   Inequalities, Absolute Values, Powers   16-22

Week 2 – Tutorial 1
L.3   Solving Equalities and Inequalities, Simultaneous Equations   22-30
L.4   Sum and Product notations, Set Theory   31-48, 49-55, 58-62

Week 3 – Tutorial 2
L.5   Functions, Graphing Functions, Inverse Functions   63-66, 69-81
L.6   Logarithmic and Exponential Functions, Composite Functions   81-100

Week 4 – Tutorial 3 – Assignment 1 due
L.7   Derivatives. Differentiation using Rules   101-107
L.8   Further Differentiation Methods   108-111

Week 5 – TEST 1 (15 August, covers weeks 1-4 topics, rooms to be announced
L.9   Application of derivatives: Elasticities. Higher Derivatives   111-115
L.10   Concave functions, Graphs using derivatives, Maxima and   117, 120-126
       Minima

Week 6 – Tutorial 4 – Assignment 2 due
L.11   More on Maxima and Minima, Applications   128-129
L.12   Integration   130-135, 138-164

Week 7 – *(no tutorial this week)*
L.13   Partial Differentiation   165-170
L.14   Total Derivatives   170-174

Week 8 – Tutorial 5 – Assignment 3 due
L.15   Optimizing Functions of Two Variables   176-181
L.16   Constrained Optimisation   181-195

Week 9 – Tutorial 6
L.17   Geometric Progressions, Compound Interest   196-203
L.18   Discounting, Present Values   203-206, 209-215, 223-230

Week 10 – TEST 2 (3 October, covers weeks 5-8 topics, rooms to be announced)
L.19   Vectors. Inner Products   235-238
L.20   Orthogonal Vectors. Linear Dependence   238-257

Week 11 – Tutorial 7 – Assignment 4 due
L.21   Matrices   244-250
L.22   Determinants   250-257

Week 12 – Tutorial 8
L.23   Inverting Matrices   257-259
L.24   Solving Linear Equation Systems   261-267, 275-288