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 3, 2012

COURSE OUTLINE

Lecturer/Coordinator: Dr. Mohammed Khaled, RH322, 463-5787
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Office hours: By appointment

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Course website: http://www.blackboard.vuw.ac.nz/

Trimester Dates
Teaching Period: Monday 7 January 2013 – Friday 15 February 2013
Examination Period: Monday 18 February – Saturday 23 February 2013 (inclusive)

Withdrawal from Course

1. Your fees will be refunded if you withdraw from this course on or before one full week after the first class.

2. The standard last date for withdrawal from this course is 5 February.

After the last date stated in #2, 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
Tuesday and Thursday, 10:00 – 11.50, HMLT206

Attending lectures is not compulsory, but learning by attending lectures besides reading the textbook is a vital component of the course. If you have to miss a lecture for any reason, please organise with a class mate to share notes. To encourage attendance at lectures, and to develop skills in listening and note taking, complete lecture notes are neither uploaded to the course Blackboard site nor supplied to students individually.

Tutorials
Besides the lectures, a total of four 2-hour tutorials will be offered during the trimester according to the schedule appended to this outline. The available tutorial times and the signing in procedure will be notified through Blackboard: http://www.blackboard.ac.nz. You can sign up for tutorials at: https://signups.victoria.ac.nz/

Attendance at tutorials is not required either. However, attending tutorials is important as model answers to tutorials are not uploaded onto Blackboard nor are they supplied to individual students. The purpose of tutorials is to learn by trying to answer the questions on your own, and then actively participating in discussions about those answers in a small group setting.

Course Content
A brief outline of the course content (topics or themes to be covered), including an indicative schedule for the order of coverage.

Course Learning Objectives
By the end of this 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 2-hour weekly lectures and a total of four 2-hour 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 4 hours in lecture per week, 8 hours in tutorials during the trimester, and about 20 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 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 the higher.

Test 1 is held in week 3 (25 January), test 2 in week 5 (8 February) 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 with prior approval. 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 5pm on a Tuesday) 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 Building. 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 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 FCA programmes. All material used for such processes will be treated as confidential, and the outcome will not affect your grade for the course.

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 you supplied with your enrolment unless you advise otherwise.

Link to general information

For general information about course-related matters, go to

http://www.victoria.ac.nz/vbs/studenthelp/information-for-staff

LECTURE SCHEDULE

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

Week 1			**Pages**
Tue 8 Jan	L1	Numbers, Number Operations, Simplifying Expressions, Inequalities, Absolute Values, Powers	1-22
Thu 10 Jan	L2	Solving Equalities and Inequalities, Simultaneous Equations, Sum and Product notations, Set Theory	22-55, 58-62
Week 2		**Tutorial 1**	
Tue 15 Jan	L3	Functions, Graphing functions, Inverse functions, Logarithmic and Exponential Functions, Composite Functions	63-100
Thu 17 Jan	L4	Derivatives, Differentiation using rules, Further differentiation methods	101-111
Week 3		**Tutorial 2**	
Tue 22 Jan		**Assignment 1 due**	
Tue 22 Jan	L5	Application of derivatives: Elasticities. Higher derivatives	111-115
		Concave functions, Graphs using derivatives, Maxima and Minima	117, 120-126
Thu 24 Jan	L6	More on Maxima and Minima, Applications,	128-135
		Integration	138-164
Fri 25 Jan		**Test 1**	
Week 4			
Tue 29 Jan		**Assignment 2 due**	
Tue 29 Jan	L7	Partial Differentiation	165-170
		Total Derivatives	170-174
Thu 31 Jan	L8	Optimizing Functions of Two Variables	176-181
		Constrained Optimisation	181-195
Week 5		**Tutorial 3**	
Tue 5 Feb		**Assignment 3 due**	
Tue 5 Feb	L9	Geometric Progressions, Compound Interest	196-206
		Discounting, Present Values	209-215, 223-230
Thu 7 Feb	L10	Vectors. Inner Products	235-238
		Orthogonal Vectors, Linear Dependence	238-244
Fri 8 Feb		**Test 2**	
Week 6		**Tutorial 4**	
Tue 12 Feb		**Assignment 4 due**	
Tue 12 Feb	L11	Matrices	244-250
		Determinants	250-257
Thu 14 Feb	L12	Inverting Matrices	257-259
		Solving Linear Equation Systems	261-267, 275-288