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, 2013

COURSE OUTLINE

Lecturer/Coordinator:	Dr. Mohammed Khaled, RH322, 463-5787
Email:	mohammed.khaled@vuw.ac.nz
Office hours:	By appointment
Administrator:	Francine McGee, RH319, 463-5818
Email:	francine.mcgee@vuw.ac.nz
Course website:	http://www.blackboard.vuw.ac.nz

Trimester Dates
Teaching Period: Monday 6 January 2014 – Friday 14 February 2014
Examination Period: Monday 17 February 2014 – Saturday 22 February 2014 (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 2014.

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. 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. Please organise a class mate to share notes with in case you have to miss a lecture for any reason.

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 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, <u>attending tutorials is important as model answers to tutorials are not uploaded onto Blackboard nor are they supplied to individual students</u>. 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 appears later.

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 and of many variables
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
This 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.

Prescription
Mathematical methods appropriate for study of economics and finance: set theory, functions, calculus of functions of one or several variables, financial mathematics, vectors, matrices and systems of linear equations.

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. Calculators will be essential for the test and final exam, however they must be silent in operation and have their own power source.

Assessment

Your performance will be evaluated on the basis of:

- 40% two 50-minute tests (CLO 1-5) and 60% 2-hour final exam (CLO 1-9), OR
- 100% 2-hour final exam (CLO 1-9), whichever is higher.

Test 1 is held in week 3 (Wednesday 22 January), test 2 in week 5 (Wednesday 5 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 <u>with prior approval</u>.

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 <u>not</u> 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 and answers to the assignments will be posted on Blackboard.

Penalties

Late assignments will not be marked.

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 following period:

- 17-22 February 2014

Mandatory Course Requirements

There are no mandatory course requirements.

If you cannot sit a test or examination, in the first instance, contact the Course Administrator to discuss the options. In the case that you wish to consider applying for an aegrotat, refer to www.victoria.ac.nz/home/study/exams-and-assessments/aegrotat.

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.

Student feedback

Student feedback on University courses may be found at
www.cad.vuw.ac.nz/feedback/feedback_display.php

Link to general information

For general information about course-related matters, go to
http://www.victoria.ac.nz/vbs/studenthelp/general-course-information

Note to Students

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 academic audit. The findings may be used to inform changes aimed at improving the quality of VBS programmes. All material used for such processes will be treated as confidential, and the outcome will not affect your grade for the course.

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LECTURE SCHEDULE

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

Week 1				Pages
Tuesday	L1	Numbers, Number operations, Simplifying expressions, Inequalities, Absolute values, Powers		1-22
Thursday	L2	Fractional powers, Solving equalities and inequalities, Simultaneous equations, Subscripted variables, Sum notation		22-55, 58-62
Week 2		**Tutorial 1**		
Tuesday	L3	Product notation, Sets and set operations, Functions and graphs, Inverse functions, Logarithmic and exponential Functions, Composite functions		63-100
Thursday	L4	Derivatives, Differentiation using rules, Further differentiation methods		101-111
Week 3		**Tutorial 2, Assignment 1 due, Test 1 (Wednesday 22 January)**		
Tuesday	L5	Application of derivatives, Elasticities, Higher derivatives		111-115
		Concave functions, Graphs using derivatives, Maxima and Minima		117, 120-126
Thursday	L6	More on maxima and minima, Applications,		128-135
		Integration		138-164
Week 4		**Assignment 2 due**		
Tuesday	L7	Partial differentiation		165-170
		Total derivatives		170-174
Thursday	L8	Optimizing functions of two variables		176-181
		Constrained optimisation		181-195
Week 5		**Tutorial 3, Assignment 3 due, Test 2 (Wednesday 5 February)**		
Tuesday	L9	Geometric progressions, Compound interest		196-206
		Discounting, Present values		209-215, 223-230
Thursday	L10	Vectors and vector operations, Inner products		235-238
		Orthogonal vectors, Linear independence		238-244
Week 6		**Tutorial 4, Assignment 4 due**		
Tuesday	L11	Matrices		244-250
		Determinants		250-257
Thursday	L12	Inverting matrices		257-259
		Solving linear equation systems		261-267, 275-288