

School of Economics and Finance

## QUAN 111 MATHS FOR ECONOMICS AND FINANCE

Second Trimester 2005

### COURSE OUTLINE

#### Contact Details

Course coordinator and lecturer weeks 1 – 6 – Penelope Proffitt EA129 – available Monday, Wednesday and Thursdays, other times by appointment. Phone 463 -7449 on those days, otherwise 463-5818.

Lecturer weeks 7 – 12 Cushla Thompson, room and time details announced later.

#### Class Times and Room Numbers

QUAN 111 will be taught by means of three lectures and one clinic (tutorial) session per week. The lectures are given in two separate streams: Monday, Wednesday and Thursday 12 noon (crn 6107) in KKL303, and at 2 - 3 pm (crn 6469) Monday, Wednesday and Thursday in EALT006. Attendance at lectures is voluntary - you should assess your need to attend by the degree to which you can understand the material in the text and by your performance in clinics and assignments. Note, however, that although the lecture outline is a fairly reliable guide to what will be covered, lecturers may occasionally include a small amount of additional material. It is your responsibility to keep in touch with what is happening in lectures.

Clinics are a form of tutorial focussing on exercises from the material covered in lectures during the previous week. Clinic exercises appear in the *QUAN 111 Coursebook 2005*. All students are expected to purchase the Coursebook from SNDC; it contains a list of supplementary reading and all the assignment and clinic questions.

You should attempt the specified questions *before* going to your clinic; during the clinic the tutor will give you answers to most of the questions, either by writing them on the board or by using the overhead projector. As the available time is limited, the tutor may ask you to identify the major problem areas in order to go over the solutions to those at length.

Attendance at two of the clinics (3 and 6) is compulsory, but we will record your attendance in all the clinics as regularity of attendance and performance in assignments will be taken into

consideration in determining some marginal grades. Clinics also offer helpful practice in solving problems similar to those in assignments due in the following week.

The time of clinic-sign-up will be given in the first lecture. All students will sign-up online, using Blackboard. Please sign up that day following the instructions given on Blackboard. Make a note of the **clinic group number, day, time and place** of the clinic group which you have selected (maximum 25 students per clinic). **Clinics are scheduled to begin in the second week of classes**, i.e. the week commencing Monday July 11.

The final examination will be held during the period 10 October to 5 November.

### Course Objectives

Students are expected to master differentiation of functions of one and two variables and to apply related techniques to a variety of situations in economics and finance; to become familiar with some mathematical options in *EXCEL*; to understand basic concepts of financial mathematics and use them to calculate interest payments and evaluate investment projects; to recognise linear dependence between vectors, be able to find determinants and inverses of square matrices (up to  $4 \times 4$ ), to solve linear equations and to model input-output relations in terms of linear systems.

### Course Content

#### SCHEDULE (References to Mathematics for Business and Economics)

Lecturer weeks 1 - 6: Ms Penelope Proffitt

#### Week 1 (July 4 - 8) - Enrol in a Clinic on July 6

Mon	Jul 4	L.1	Real Numbers, Operations and Inequalities.	(pp8-16)
Wed	Jul 6	L.2	Absolute Values. Powers.	(pp16-22)
Thu	Jul 7	L.3	Solving Equations and Inequalities.	(pp22-30)

#### Week 2 (July 11 - 15) - Clinic 1

Mon	Jul 11	L.4	Set Theory: Basic Ideas, Operations, Venn Diagrams.	(pp47-55)
Wed	Jul 13	L.5	Functions and Relations	(pp61-64)
Thu	Jul 14	L.6	Graphing Functions	(pp66-72)

#### Week 3 (July 18-22) - Clinic 2

Mon	Jul 18	L.7	Inverse Functions. Linear Interpolation. <b>Ass. 1 due</b>	(pp72-76)
Wed	Jul 20	L.8	Logarithmic and Exponential Functions.	(pp76-80)
Thu	Jul 21	L.9	Revision of Chapters 1 to 4.	

#### Week 4 (July 25 - 29) - Clinic 3 (in computer labs)

Mon	Jul 25	L.10	Derivatives. <b>Ass. 2 due</b>	(pp96-99)
Wed	Jul 27	L.11	Differentiation Rules.	(pp100-104)
Thu	Jul 28	L.12	Further Differentiation Methods. Elasticities.	(pp104-107)

#### Week 5 (August 1 - 5) - Clinic 4

Mon	Aug 1	L.13	Higher Derivatives. Maxima and Minima. <b>Ass. 3 due</b>	(pp107-116)
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Wed	Aug 3	L.14	Global Maxima and Minima. Graphing Functions Again.	(pp116-118)
Thu	Aug 4	L.15	Newton's Method. Maxima and Minima Applications.	(pp118-121)
<b>Week 6 (August 8 - 12) - Clinic 5</b>				
Mon	Aug 8	L.16	Revision of Calculus of One Variable. <b>Ass. 4 due</b>	(chapter 5)
Wed	Aug 10	L.17	Integration.	(pp121-127)
Thu	Aug 11	L.18	Partial Differentiation.	(pp153-157)

**MID-TRIMESTER TEST THURSDAY AUGUST 11, 6.30 pm – 7.20pm**  
**Covers the course materials for the first sixteen lectures**

**Sat August 15 - Sun August 28: Mid-Trimester Break**

Lecturer Weeks 7 - 12: Ms Cushla Thompson

**Week 7 (Aug 29 – Sept 2) - Clinic 6 (in computer labs)**

Mon	Aug 29	L.19	Total Derivatives. <b>Ass. 5 due</b>	(pp157-161)
Wed	Aug 31	L.20	Optimizing Functions of Two Variables.	(pp161-165)
Thu	Sep 1	L.21	Constrained Optimisation and Revision of Calculus of Two Variables.	(pp165-168)

**Week 8 (Sept 5 - 9) - Clinic 7**

Mon	Sep 5	L.22	Geometric Progressions. Interest. <b>Ass. 6 due</b>	(pp178-182)
Wed	Sep 7	L.23	Non-Annual Compounding. Discounting.	(pp182-185)
Thu	Sep 8	L.24	Investment Appraisal.	(pp186-190)

**Week 9 (Sept 12 - 16) - Clinic 8**

Mon	Sep 12	L.25	Annuities. <b>Ass. 7 due</b>	(pp190-195)
Wed	Sep 14	L.26	Variations.	(pp195-198)
Thu	Sep 15	L.27	Revision of Financial Mathematics	(Chapter 7)

**Week 10 (Sept 19 – 23) - Clinic 9**

Mon	Sep 19	L.28	Vectors. Inner Products. <b>Ass. 8 due</b>	(pp210-213)
Wed	Sep 21	L.29	Geometric Interpretation of Vectors.	(pp213-215)
Thu	Sep 22	L.30	Linear Dependence.	(pp215-219)

**Week 11 (Sept 26 - 30) - Clinic 10**

Mon	Sep 26	L.31	Matrices. <b>Ass. 9 due</b>	(pp219-222)
Wed	Sep 28	L.32	Matrice Multiplication and Determinants.	(pp222-227)
Thu	Sep 29	L.33	More on Determinants.	(pp228-231)

**Week 12 (Oct 3 - 7) - Clinic 11**

Mon	Oct 3	L.34	Inverting Matrices.	(pp231-235)
Wed	Oct 5	L.35	Solving Linear Equation Systems.	(pp235-242)
Thu	Oct 6	L.36	Input-Output Models and Revision of Linear Algebra.	(pp242-244)

## Readings

All students should purchase *Mathematics for Business and Economics*, by Mohammed Khaled and Penelope Proffitt, Prentice Hall, 2003. 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:

Mik Wisniewski, *Introductory Mathematical Methods in Economics*, 2nd ed. McGraw-Hill, 1996 (HB135 W815 I)

Frank S. Budnick, *Applied Mathematics for Business, Economics and the Social Sciences*, 4th ed. McGraw-Hill, 1993 (QA 37.2 B 927 A)

D. Leonard, *Mathematical Methods in Accountancy, Economics and Finance*, Prentice-Hall of Australia, 1980 (QA 36 L581 M)

K. Holden and A.W. Pearson, *Introductory Mathematics for Economists* Macmillan Press, 1983 (London: 2nd ed) (HB 135 H726 I)

D. Zill, E. Beckenbach, I. Drooyan and W. Wooton, *College Mathematics for Students of Business and the Social Sciences*, Wadsworth, 1977 (QA 37.2 C697)

E.T. Dowling, *Mathematics for Economists*, Schaum/McGraw-Hill, 1980, (HB 135 D747 S) has a good selection of worked problems.

If you need to revise basic algebra and calculus, then you could consult the following books, available in the library on Closed Reserve and for purchase through Victoria Book Centre:

Penelope Proffitt, *Maths Made Easy*, Prentice Hall, 2002.

Pat Belgrave and Colin Jeffcoat, *You Can Do Maths*, Dunmore Press, 1995.

Finally, a book which shows in a simple and entertaining way how mathematics can be applied to economic thinking is:

G. Kennedy, *Mathematics for Innumerate Economists*, Holmes & Meier, 1982 (HB 135 K35 M).

## Materials and Equipment

Non-programmable calculators are allowed. Graphics calculators are allowed but not recommended.

## Assessment Requirements

### (a) Submission of Assignments

Assignment questions are in the Coursebook. Assignments are due on Mondays at 2.00 p.m.; **answer all questions**. Late submissions are not accepted (unless in exceptional circumstances, in which case you must inform Ms Proffitt). 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 one for each assignment. Since the marks do not count towards your final grade, there is no need for a provision for remarking. Marks will be displayed weekly on Blackboard.

Do NOT copy answers from others, or let others copy from yours. Copied assignments of all parties will get a zero mark, and thus will not count towards the “Terms” requirements explained below.

**ASSIGNMENT LABELS printed at the back of the coursebook are to be completed with your name, ID and clinic group number; you must attach one of these to each of your assignments, otherwise they won’t get marked. Please staple all sheets together and do not fold them.**

(b) Return of Assignments

Assignments will be returned at clinics; if you make a mistake and submit your assignment to the wrong tutor, it is your responsibility to contact that tutor to collect your assignment. Model answers will be available from Blackboard.

(c) Final grade calculation

Your final mark will be calculated as EITHER a weighted average of the marks obtained in the test and the final examination (the weights being 30% and 70% respectively) OR the marks obtained for the final examination, whichever is the higher. To pass the course your final mark must be at least 50%. If you are not able to sit the test, the final examination will be weighted 100% towards your final mark. We reserve the right to scale results if necessary to preserve comparability with other years.

**Penalties**

Late submissions are not accepted (unless in exceptional circumstances, in which case you must inform Ms Proffitt

**Mandatory Course Requirements**

A provisional list of those not fulfilling these requirements will be posted no later than Friday October 7. To obtain terms you should

1. complete the two computer clinics (Clinics 3 and 6), and

2. submit **on time sufficient assignments to score** at least 7 from the 9 assignments. (Missed assignments will still be marked 0). Note that the marks do not contribute to your final grade.

Students denied terms may appeal. For your appeal to have any chance of success, however, you must present evidence of special circumstances that prevented you from meeting the terms conditions. (If your performance in the test or assignments is affected by ill health you should take a medical certificate to Ms Proffitt as soon as possible). **If you fail terms you may not sit the final examination; if you do so you will receive an ungraded fail, a Q.**

### **Communication of Additional Information**

General information about the course, including clinic times, will be posted on Blackboard (<http://www.blackboard.vuw.ac.nz>). It is important that you check this regularly. **QUAN 111 staff will take no responsibility for students claiming ignorance of important information which is posted on Blackboard.**

## **Faculty of Commerce and Administration Offices**

### Railway West Wing (RWW) - FCA Student Administration Office

The Student Administration Office is located on the ground and first floors of the Railway West Wing. The ground floor counter is the first point of contact for general enquiries and FCA forms. Student Administration Advisers are available to discuss course status and give further advice about FCA qualifications.

### Easterfield (EA) - FCA/Law Kelburn Office

The Kelburn Campus Office for the Faculties of Commerce & Administration and Law is situated in the Easterfield Building - it includes the ground floor reception desk (EA005) and offices 125a to 131 (Level 1). The office, will be open from 9:00 am to 5:00 pm during Trimester 2, offers the following:

- Duty tutors for student contact and advice.
- Information concerning administrative and academic matters.
- FCA Student Administration forms (e.g. application for academic transcripts, requests for degree audit, COP requests).
- Examinations-related information during the examination period.

Please note:

There will be a Student Administration Adviser, from the RWW office, based in EA005 from Monday 27 June to Friday 1 July (9:00 am to 5:00 pm) and from Monday 4 July to Friday 22 July (11:00 am to 1:00 pm).

## **General University Policies and Statutes**

Students should familiarise themselves with the University's policies and statutes, particularly those regarding assessment and course of study requirements, and formal academic grievance procedures.

### **Student Conduct and Staff Conduct**

The Statute on Student Conduct together with the Policy on Staff Conduct ensure that members of the University community are able to work, learn, study and participate in the academic and social aspects of the University's life in an atmosphere of safety and respect. The Statute on Student Conduct contains information on what conduct is prohibited and what steps can be taken if there is a complaint. For queries about complaint procedures under the Statute on Student Conduct, contact the Facilitator and Disputes Advisor. This Statute is available in the Faculty Student Administration Office or on the website at:

[www.vuw.ac.nz/policy/StudentConduct](http://www.vuw.ac.nz/policy/StudentConduct).

The policy on Staff Conduct can be found on the VUW website at:

[www.vuw.ac.nz/policy/StaffConduct](http://www.vuw.ac.nz/policy/StaffConduct).

### **Academic Grievances**

If you have any academic problems with your course you should talk to the tutor or lecturer concerned or, if you are not satisfied with the result of that meeting, see the Head of School or the Associate Dean (Students) of your Faculty. Class representatives are available to assist you with this process. If, after trying the above channels, you are still unsatisfied, formal grievance procedures can be invoked. These are set out in the Academic Grievances Policy which is published on the VUW website:

[www.vuw.ac.nz/policy/AcademicGrievances](http://www.vuw.ac.nz/policy/AcademicGrievances).

## **Academic Integrity and Plagiarism**

Academic integrity is about honesty – put simply it means **no cheating**. All members of the University community are responsible for upholding academic integrity, which means staff and students are expected to behave honestly, fairly and with respect for others at all times.

Plagiarism is a form of cheating which undermines academic integrity. Plagiarism is **prohibited** at Victoria.

The University defines plagiarism as follows:

Plagiarism is presenting someone else's work as if it were your own, whether you mean to or not.

*'Someone else's work' means anything that is not your own idea, even if it is presented in your own style. It includes material from books, journals or any other printed source, the work of other students or staff, information from the Internet, software programmes and other electronic material, designs and ideas. It also includes the organization or structuring of any such material.*

### ***Plagiarism is not worth the risk.***

Any enrolled student found guilty of plagiarism will be subject to disciplinary procedures under the Statute on Student Conduct ([www.vuw.ac.nz/policy/studentconduct](http://www.vuw.ac.nz/policy/studentconduct)) and may be penalized severely. Consequences of being found guilty of plagiarism can include:

- an oral or written warning
- suspension from class or university
- cancellation of your mark for an assessment or a fail grade for the course.

*Find out more about plagiarism and how to avoid it, on the University's website at: [www.vuw.ac.nz/home/studying/plagiarism.html](http://www.vuw.ac.nz/home/studying/plagiarism.html).*

## **Students with Disabilities**

The University has a policy of reasonable accommodation of the needs of students with disabilities. The policy aims to give students with disabilities an equal opportunity with all other students to demonstrate their abilities. If you have a disability, impairment or chronic medical condition (temporary, permanent or recurring) that may impact on your ability to participate, learn and/or achieve in lectures and tutorials or in meeting the course requirements, then please contact the Course Coordinator as early in the course as possible. Alternatively you may wish to approach a Student Adviser from Disability Support Services to confidentially discuss your individual needs and the options and support that are available. Disability Support Services are located on Level 1, Robert Stout Building, or phoning 463-6070, email: [disability@vuw.ac.nz](mailto:disability@vuw.ac.nz). The name of your School's Disability Liaison Person can be obtained from the Administrative Assistant or the School Prospectus.

## **Student Support**

Staff at Victoria want students' learning experiences at the University to be positive. If your academic progress is causing you concern, please contact the relevant Course Co-ordinator, or Associate Dean who will either help you directly or put you in contact with someone who can.



The Student Services Group is also available to provide a variety of support and services. Find out more at [www.vuw.ac.nz/st\\_services/](http://www.vuw.ac.nz/st_services/) or email [student-services@vuw.ac.nz](mailto:student-services@vuw.ac.nz).

VUWSA employs two Education Coordinators who deal with academic problems and provide support, advice and advocacy services, as well as organising class representatives and faculty delegates. The Education Office is located on the ground floor, Student Union Building, phone 463 6983 or 463 6984, email [education@vuwsa.org.nz](mailto:education@vuwsa.org.nz).

### **Maori and Pacific Mentoring programme (Manaaki Pihipihinga)**

This is a free programme of mentoring for Maori and Pacific students doing first year courses within the Faculty of Commerce and Administration. Weekly one hour mentoring sessions: drafting and editing assignments/discussing any questions that you might have from tutorials or lectures and going over every aspect of essay writing, either in small group sessions or on a one-to-one basis.

This includes:

- A computer suite hooked up to cyber commons for students to use to produce their assignments.
- Regular skill-based workshops with a learning adviser from Student Learning Support Services.
- Networking with other Maori and Pacific support groups throughout the university.

For more information please contact:

Melissa Dunlop, Programme Coordinator

Ph: 463 6015 or Email: [Maori-Pacific-Mentoring@vuw.ac.nz](mailto:Maori-Pacific-Mentoring@vuw.ac.nz)