MACQUARIE UNIVERSITY

FACULTY OF BUSINESS AND ECONOMICS

ECON131
Quantitative Methods in Economics, Business and Finance

Semester 1, 2011

Department of Economics

MACQUARIE UNIVERSITY
FACULTY OF Business and Economics
UNIT OUTLINE

Year and Semester: Second Semester, 2010

Unit convenor: Dr. Edwin Franks

Prerequisites: None

Students in this unit should read this unit outline carefully at the start of semester. It contains important information about the unit. If anything in it is unclear, please consult one of the teaching staff in the unit.

ABOUT THIS UNIT

- Credit Points: 3

- This unit introduces mathematical techniques used to analyse problems in economics, business and finance. It is highly recommended for students who have not studied HSC mathematics, but intend to enrol in units for which it is assumed knowledge. The unit is also recommended for students who have completed HSC-level mathematics and need to extend their knowledge of mathematical techniques to applications in business, economics and finance. The topics covered in this unit include: basic financial mathematics; multiplier analysis; marginal analysis; static linear models; dynamic linear models; constrained optimisation and unconstrained optimisation. The applications vary from year to year, but typically include the solution of macroeconomic models, optimal production and pricing problems, and portfolio selection. The mathematical topics covered include: functions of several variables; limits; calculus of single-variable and multiple-variable functions; optimisation; matrix algebra; and complex variables. This quantitative methods unit combines elements of mathematics and economics. However, the unit is neither a unit in mathematics, nor technically in economics. Rather, it is about the unification of mathematics and economics. Its objective is to allow students to formulate and analyse problems in business, economics and finance in the language of, and using the power of, mathematics.

- This unit has 3 credit points, which means that the workload is about 9 hours per week. The workload includes the 2 hour lecture and 1 hour tutorial. The workload is applied across the 15 weeks during the semester, that is, the 13 teaching weeks plus the 2 mid-semester recess weeks.

Teaching staff

	Room	Telephone	Email
Unit Convenor			
▪ Dr. Edwin Franks	E4A 421	9850 7076	efranks@efs.mq.edu.au
Unit Administrator			
▪ Dr. Edwin Franks	E4A 421	9850 7076	efranks@efs.mq.edu.au

Consultation times

Students will be notified of all staff consultation hours during the first lecture in week 1. For Edwin Franks consultation hours for Semester 1 2011 are

- **Monday from 2 until 4pm.**
- **Thursday from 1 until 3pm.**

The consultation timetable will also be made available in the unit's website.

Students are encouraged to seek help at a time that is convenient to you from a staff member teaching on this unit during their regular consultation hours. In special circumstances, an appointment may be made outside regular consultation hours. Staff will not conduct any consultations by e-mail. Please note however that staff will only answer emails sent from official Macquarie University email accounts. You may, however, phone staff during their consultation hours.

In order to gain access to staff located at level 4 of building E4A during their consultation hours please ring the staff member from the phones available in the lobby (phone numbers of relevant staff members will be provided on Blackboard and are available next to the phones).

Students experiencing significant difficulties with any topic in the unit are strongly encouraged to seek assistance immediately.

Classes

Classes in ECON131 are composed of two hour lectures and one hour tutorial. Unit materials are learnt by attending lectures, tutorials, and through independent learning.

Students should attend a two-hour lecture every week as well as the one hour tutorial beginning in the second week. Lecture slides will be available at the unit's Web site. The lecture will also be available via ilecture two days after the lecture.

Required and Recommended texts and/or materials

The required text for ECON131 is *Mathematics for Economics and Business* (http://www.pearson.com.au/Catalogue/TitleDetails.aspx?isbn=9780273722281) Access to the MathXL package will also be essential.

Course ID for MathXL: **XL00-31JE-901Z-72E4**
URL: http://global.mymathlabglobal.com/login_hedmaths.htm?noinit

There are two required open source software packages

- Gnuplot http://www.gnuplot.info/
- Maxima http://sourceforge.net/projects/maxima/files/

Other useful open source packages include

- Gretl http://gretl.sourceforge.net/win32/
- Octave http://octave.sourceforge.net/
- R http://cran.ms.unimelb.edu.au/
- Jaysymca http://webuser.hs-furtwangen.de/~dersch/jasymca2/indexEN.html

Two important commercial packages are the ubiquitous MS excel and

- Matlab http://www.mathworks.com/products/matlab/

Additional recommended reading material will be provided during the semester.

Technology Used and Required

Blackboard CE6 is an online program available at http://learn.mq.edu.au/ through which students will be able to access resources to assist them throughout the semester. Some slide presentations will be available through iLecture.

Unit web page

The following information will be available on Blackboard:

• Unit Outline	• Announcements
• Lecture slides	• iLecture
• Information on Assessments	• Staff consultation hours and contact details
• Homework Assignments	• Other relevant material

You are strongly encouraged to regularly visit the website and use it as a resource centre to assist with your learning.

If you are unable to access the website because you are not aware of or have forgotten your username and password, please contact the IT helpdesk located on Level 1 of the Library on 9850 6500. The IT helpdesk will also be able to assist you with using Blackboard. Please note that there is also a help feature in Blackboard and you may refer to this instead for assistance in using Blackboard. If you have contacted the helpdesk in regard to your username and password and you are still unable to login to Blackboard you should then contact the Unit Administrator.

Please remember to log out when you have finished using Blackboard. Failure to do so could result in unauthorised access to your Blackboard account.

Generic Skills

ECON131 is about the unification of mathematics and economics. Its objective is to allow students to formulate and analyse problems in business, economics and finance in the language of, and using the power of, mathematics. The unit will enhance your skills in critical thinking, analysis, problem solving, and the communication of quantitative information and analysis.

Learning outcomes

The learning outcomes of this unit are to:

1. Understand the role of mathematics within economics.
2. Learn the mathematical skill required to work with mathematical models in economics.
3. Use mathematical software to solve problems in economics.
4. Effectively communicate quantitative analysis and information

Teaching and Learning Strategy

The teaching strategy in ECON131 recognises that students learn independently and assume responsibility for the learning process and with academic integrity.
Students are expected to participate in the unit by attending lectures, reading the provided material, thoroughly revising the lecture notes and preparing answers to the provided exercise questions and reading additional material about important issues in finance.

The teaching philosophy is articulated as follows:

Lectures – large group learning (2 hour each teaching week)

Lectures are intended to provide an overview of conceptual frameworks and issues in applied finance that are critical to the core themes of the unit.

Tutorials – small group learning (1 hour each teaching week beginning the second week)

Tutorials are intended to provide help problem solving, a chance to ask questions, an opportunity to learn how to use gnuplot and maxima, as well as a time to meet face to face with other students. Tutorial questions will be provided for most tutorials.

Independent learning – learning by doing (about 6 hours each teaching week and 9 hours each week during the 2-week mid-semester recess)

Lecture and Topic Schedule

Week	Topic and Required Reading
1	Linear models Chapter 1
2	Non-Linear Models Chapter 2
3	Exponentials and Logarithms Chapter 3
4	Differentiation Chapter 4 and supplementary material on differentiation from first principles.
5	Rules for Differentiation, Elasticity Chapter 4
6	Optimization and Implicit Differentiation Chapter 4 and supplementary material on implicit differentiation.
7	Linear Algebra Chapter 7
8	Mid-Semester Test and Linear Algebra Chapter 7
9	Functions of Several Variables, partial differentiation, partial elasticity, comparative statics Chapter 5 Sections 1 to 3
10	Functions of Several Variables Unconstrained and constrained optimization Chapter 5 Sections 4 and 5, and supplementary material on Hessians.
11	Lagrange multipliers Chapter 5 Section 6 and http://www.youtube.com/watch?v=ry9cgNx1QV8 Definite Integrals Chapter 6 section 2
12	Indefinite Integrals Chapter 6 section 1
13	Integration Chapter 6 and Review

Assessment

The unit assessment will be based on the best five of **six** online quizzes, **two** homework assignments, **either** 10 in tutorial quizzes **or** 2 alternative assignments, a mid-semester test, and a final examination.

The **online quizzes** will be conducted during weeks 2, 4,6, 8,10, and 12. The quizzes will contain questions like those in the textbooks and will be administered through MathXL.

The **homework assignments** will be distributed via blackboard during weeks 2 and 8 and will be due in weeks 7 and 13.

The **in tutorial quizzes** will be conducted during 10 of the 12 tutorials.

The **alternative assignments** will be distributed via blackboard during weeks 4 and 9 and will be due in weeks 8 and 13.

The **mid-semester test** will be multiple choice questions that will cover everything up to week 7. The test is scheduled for the first 60 minutes of Week 8, there will be **50** minutes given to work on the test.

The **final examination** will cover the entire semester. The final examination will be scheduled by the University during the examination period.

All assessment tasks further develop problem solving, knowledge on applied finance and communication skills.

The individual tasks enter the overall assessment with the following weights:

Online Quizzes:	10%
Homework Assignments:	10%
In Tutorial Quizzes/Alternative Assignments:	10%
Mid-semester test:	20%
Final Examination:	50%

The final grade will be determined after consideration of performance in all aspects of the course.

You are expected to present yourself for examination at the time and place designated in the University Examination Timetable. The timetable will be available in Draft form approximately eight weeks before the commencement of the examinations and in Final form approximately four weeks before the commencement of the examinations. The relevant website is http://www.timetables.mq.edu.au/exam

The only exception to not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these circumstances you may wish to consider applying for Special Consideration (see page 4 also).

If a Supplementary Examination is granted as a result of the Special Consideration process the examination will be scheduled after the conclusion of the official examination period.

You are advised that it is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, that is, the final day of the official examination period.

Academic Honesty

The nature of scholarly endeavour, dependent as it is on the work of others, binds all members of the University community to abide by the principles of academic honesty. Its fundamental principle is that all staff and students act with integrity in the creation, development, application and use of ideas and information. This means that:

- all academic work claimed as original is the work of the author making the claim
- all academic collaborations are acknowledged
- academic work is not falsified in any way
- when the ideas of others are used, these ideas are acknowledged appropriately.

Further information on the academic honesty can be found in the Macquarie University Academic Honesty Policy at
http://www.mq.edu.au/policy/docs/academic_honesty/policy.html

Grades

Please refer to relevant Bachelor Degree rule in the Handbook of Undergraduate Studies.

Grading Appeals and final examination script viewing

If, at the conclusion of the unit, you have performed below expectations, and are considering lodging an appeal of grade and/or viewing your final exam script please refer to the following website which provides information about these processes and the cut off dates in the first instance. Please read the instructions provided concerning what constitutes a valid grounds for appeal before appealing your grade.

http://www.businessandeconomics.mq.edu.au/for/new_and_current_students/undergraduate/admin_central/grade_appeals.

Special Consideration

The University is committed to equity and fairness in all aspects of its learning and teaching. In stating this commitment, the University recognises that there may be circumstances where a student is prevented by unavoidable disruption from performing in accordance with their ability. A special consideration policy exists to support students who experience serious and unavoidable disruption such that they do not reach their usual demonstrated performance level. The policy is available at:
http://www.mq.edu.au/policy/docs/special_consideration/procedure.html

Student Support Services

Macquarie University provides a range of Academic Student Support Services. Details of these services can be accessed at http://www.student.mq.edu.au.

IT Conditions of Use

Access to all student computing facilities within the Faculty of Business and Economics is restricted to authorised coursework for approved units. Student ID cards must be displayed in the locations provided at all times.

Students are expected to act responsibly when utilising University IT facilities. The following regulations apply to the use of computing facilities and online services:

- Accessing inappropriate web sites or downloading inappropriate material is not permitted. Material that is not related to coursework for approved unit is deemed inappropriate.

- Downloading copyright material without permission from the copyright owner is illegal, and strictly prohibited. Students detected undertaking such activities will face disciplinary action, which may result in criminal proceedings.

Non-compliance with these conditions may result in disciplinary action without further notice.

Students must use their Macquarie University email addresses to communicate with staff as it is University policy that the University issued email account is used for official University communication.