



ECON131

Quantitative Methods in Economics, Business and Finance

S1 Day 2019

Dept of Economics

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General Information

Unit convenor and teaching staff

Unit Convenor and Lecturer

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Contact via 02 9850 4842

4EAR 436

Consultation Hours: TBA

Teaching Assistant

TBA

[TBA](#)

TBA

Tutors

TBA

Credit points

3

Prerequisites

Corequisites

Co-badged status

Unit description

This unit is highly recommended for students who have not studied HSC Mathematics, but who 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 who need to extend their knowledge of mathematical techniques to applications in business, economics and finance. 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 is a multi-disciplinary unit. It develops literacy in the quantitative techniques commonly used for planning and resource allocation. It is designed to provide students with the confidence to apply these techniques to practical problems relevant to the understanding of sustainability issues and to a myriad of problems in business, economics and finance. 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; calculus of single-variable and multiple-variable functions; optimisation; and matrix algebra.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

Understand the role of mathematics within economics, business and finance.

Learn about functions, linear equations, non-linear equations, differential calculus, optimization, integration, differential equations, probability and random variables; each topic is taught with applications from economics, finance and business studies.

Understand how to use and interpret quantitative tools required to work with mathematical models in economics, business, finance and sustainability issues.

Assessment Tasks

Name	Weighting	Hurdle	Due
Tutorial Work	35%	No	ongoing
Class Test	35%	No	Week 12 Lecture
Assignment	30%	No	Week 13 Friday, 4pm

Tutorial Work

Due: **ongoing**

Weighting: **35%**

Tutorial Quizzes to be held DURING the tutorials in weeks 4, 6, 8, 10 and 13 of the semester.

Students will be given short (25 minute) quizzes during the tutorial time. The quizzes are of equal value (7% each).

Students who do not submit this task by the due date and time receive a result of zero. This penalty does not apply when an application for Special Consideration has been made and approved. Note: applications for Special Consideration Policy must be made within 5 (five) business days of the due date and time.

On successful completion you will be able to:

- Understand the role of mathematics within economics, business and finance.
- Learn about functions, linear equations, non-linear equations, differential calculus, optimization, integration, differential equations, probability and random variables; each

topic is taught with applications from economics, finance and business studies.

- Understand how to use and interpret quantitative tools required to work with mathematical models in economics, business, finance and sustainability issues.

Class Test

Due: **Week 12 Lecture**

Weighting: **35%**

There is one class test in ECON131. The test is worth 35% of the final grade. The test will be of 80 minutes duration and will be conducted during the lecture. Since the purpose of the test is purely summative, students will not be provided with written feedback.

Students must be available during the time of the lecture class to sit the class test.

The only exception to this is if a student could not do the test because of documented illness or unavoidable disruption. In these circumstances this student may wish to consult the University's Special Consideration policy - <https://students.mq.edu.au/study/my-study-program/special-consideration>

If a student satisfies the Special Consideration policy they will be required to complete a supplementary assessment task two weeks after the date of the original assessment.

On successful completion you will be able to:

- Understand the role of mathematics within economics, business and finance.
- Learn about functions, linear equations, non-linear equations, differential calculus, optimization, integration, differential equations, probability and random variables; each topic is taught with applications from economics, finance and business studies.
- Understand how to use and interpret quantitative tools required to work with mathematical models in economics, business, finance and sustainability issues.

Assignment

Due: **Week 13 Friday, 4pm**

Weighting: **30%**

Students will be given one assignment worth 30% of the final grade. It is intended that students will work on the assignment independently. Students who have plagiarised will be awarded a mark of zero, will not be permitted to resubmit, and may be reported to the University Disciplinary Committee for further action.

Assignment submission instructions will be posted on iLearn in a clearly labelled folder, titled: "Assignment".

Students who do not submit an assignment will be awarded a mark of zero for that assessment.

Late submission: No extensions will be granted. There will be a deduction of 10% of the total available marks made from the total awarded mark for each 24 hour period or part thereof that

the submission is late (for example, 25 hours late in submission incurs a 20% penalty). Late submissions will be accepted up to 96 hours after the due date and time. This penalty does not apply for cases in which an application for Special Consideration is made and approved. Note: applications for Special Consideration must be made within 5 (five) business days of the due date and time.

On successful completion you will be able to:

- Understand the role of mathematics within economics, business and finance.
- Learn about functions, linear equations, non-linear equations, differential calculus, optimization, integration, differential equations, probability and random variables; each topic is taught with applications from economics, finance and business studies.
- Understand how to use and interpret quantitative tools required to work with mathematical models in economics, business, finance and sustainability issues.

Delivery and Resources

Classes

Weekly classes in ECON131 are composed of a two hour lecture and a one hour tutorial. The timetable can be viewed at <https://timetables.mq.edu.au/2019>. All students attend the same lecture stream.

There are a number of tutorial classes, and you must register via e-Student and physically attend the same class for all the tutorials. Tutorial classes are **not interchangeable**. Although the same content is covered in each class, the tutor may cover the material at a different pace, and in a slightly different way, in each class. Your class registration is complete (and correct) once you have registered for ALL activities, and have registered for the SAME class for all tutorials.

Tutorials

A tutorial consists of TWO distinct components:

- **Tutorial questions:** before each tutorial a selection of questions will be posted on the unit iLearn page. These are to be attempted before your tutorial. Your tutor will work through these problems with you during your designated tutorial time.
- **Tutorial quizzes:** Please refer to the section on "Assessment Tasks" for the precise detail of the unit's assessment components and weights.

Required and Recommended Texts and/or Materials

The required and recommended text for ECON131 is Essential Mathematics for Economics and Business, 4 Ed., by Teresa Bradley.

Additional recommended reading material will be provided during the semester.

Technology Used and Required

Unit Web Page

iLearn is an online program available at <https://ilearn.mq.edu.au/login/MQ/> through which students will be able to access resources to assist them throughout the semester.

WileyPLUS

One of the electronic versions of the required text, Essential Mathematics for Economics and Business, 4 Ed., by Teresa Bradley, comes with access to the WileyPLUS website, see here <http://www.wileydirect.com.au/buy/essential-mathematics-for-economics-and-business-4th-edition/> On this web site students will be able to develop their own study plan.

Spreadsheet

The use of a spreadsheet will often be helpful for tasks in this unit. For students who don't own or wish to use Microsoft Excel, a free alternative is provided by OpenOffice (<http://www.openoffice.org>).

Unit Schedule

	Lecture Topic and Corresponding Textbook Chapter	Tutorial Details
Week 1	Basic Concepts in Mathematical Economics, Chapters 1 & 2	Tutorial 1
Week 2	Simultaneous Linear Equations and Quadratic Functions, Chapter 3 & 4	Tutorial 2
Week 3	Exponentiation, Logarithms, Non-linear Growth Models, Chapter 4	Tutorial 3
Week 4	Financial Mathematics I: Compound Interest, Continuous Compounding, Annuities, Chapter 5	Tutorial 4: Tutorial Quiz 1
Week 5	Financial Mathematics II: Perpetuity, NPV, IRR, Chapter 5 Differentiation I: Secant Line, Tangent Line, First Derivative, Increasing and Decreasing Functions - Chapter 6	Tutorial 5
Week 6	Differentiation II: Second Derivative, Chain Rule, Chapter 6 Optimizing Total Revenue and Profit, Elasticity of Demand	Tutorial 6: Tutorial Quiz 2
Week 7	Differentiation III: Derivatives of Exponential and Logarithmic Funct's, Limits, Chapter 6 Multivariable Calculus: Functions of Many Variables, Partial Differentiation, Chapter 7	Tutorial 7

Week 8	Partial Derivatives Cont'd, Total Derivative, Small Increment Formula, Differential, Chapter 7	Tutorial 8: Tutorial Quiz 3
Week 9	Indifference Curves, Implicit Differentiation, Utility Maximization Chapter 7 Integration, Integration by Substitution, Areas and Definite Integrals, Consumer and Producer Surpluses Chapter 8	Tutorial 9
Week 10	Differential Equations, Marginal Revenue and Marginal Cost, Differential Equations and Rates of Change, Limited Growth, Constant Proportional Rate of Growth, Chapter 8	Tutorial 10: Tutorial Quiz 4
Week 11	Probability and Random Variables, Probability Density Functions, Cumulative Distribution Functions as Integrals, Expected Value and Median as Integration Problems, Variance Lecture Notes	Tutorial 11
Week 12	In-Lecture Test	Tutorial 12
Week 13	Multiple Random Variables: Double Integral, Joint Density Functions, Joint to Marginal PDFs, Independence, Covariance, Correlation Assignment Due: Fri 4pm	Tutorial 13: Tutorial Quiz 5

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note: The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.**)

Undergraduate students seeking more policy resources can visit the [Student Policy Gateway \(https://students.mq.edu.au/support/study/student-policy-gateway\)](https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit <ask.mq.edu.au> or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (<mq.edu.au/learningskills>) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at <ask.mq.edu.au>

If you are a Global MBA student contact globalmba.support@mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge,

scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Understand the role of mathematics within economics, business and finance.
- Learn about functions, linear equations, non-linear equations, differential calculus, optimization, integration, differential equations, probability and random variables; each topic is taught with applications from economics, finance and business studies.
- Understand how to use and interpret quantitative tools required to work with mathematical models in economics, business, finance and sustainability issues.

Assessment tasks

- Tutorial Work
- Class Test
- Assignment

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Understand the role of mathematics within economics, business and finance.
- Understand how to use and interpret quantitative tools required to work with mathematical models in economics, business, finance and sustainability issues.

Assessment tasks

- Tutorial Work
- Class Test
- Assignment

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Understand the role of mathematics within economics, business and finance.
- Learn about functions, linear equations, non-linear equations, differential calculus, optimization, integration, differential equations, probability and random variables; each topic is taught with applications from economics, finance and business studies.
- Understand how to use and interpret quantitative tools required to work with mathematical models in economics, business, finance and sustainability issues.

Assessment tasks

- Tutorial Work
- Class Test
- Assignment

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- Understand the role of mathematics within economics, business and finance.
- Learn about functions, linear equations, non-linear equations, differential calculus, optimization, integration, differential equations, probability and random variables; each topic is taught with applications from economics, finance and business studies.
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Assessment tasks

- Tutorial Work

- Class Test
- Assignment