



ECON764

Mathematical Techniques in Economics

S2 Evening 2018

Dept of Economics

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General Information

Unit convenor and teaching staff

Unit Convenor

Edwin Franks

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ER4 Room 421

Available on iLearn

Credit points

4

Prerequisites

Admission to MRes

Corequisites

Co-badged status

ECON864

Unit description

This unit is concerned with the mathematical techniques to problems of economic theory and policy. The theoretical section will deal with dynamics and comparative statistics. The use of difference and differential equations in the analysis of business cycles and economic growth will be the main concern of the dynamics component while the comparative statistics section deals with optimisation techniques and the stability requirements that are obtained from the dynamic analysis.

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:

Apply linear algebra techniques to determine equilibrium outcomes in macroeconomic models.

Use the technique of Lagrange multipliers to solve problems in consumer and producer theory.

Apply calculus and linear algebra to calculate the comparative statics determined by an

economic model.

Understand the theory which underlies the techniques learned.

Assessment Tasks

Name	Weighting	Hurdle	Due
Quiz	10%	No	31 August 2018
Mid-Semester Test	20%	No	9 October 2018
Assignment	20%	No	26 October 2018
Final Exam	50%	No	Exam Period

Quiz

Due: **31 August 2018**

Weighting: **10%**

Description

This is an online quiz which helps students check their understanding of the material in the first five weeks.

Extension

There will be no extensions. In the case of unavoidable circumstances students and a successful application under the Special Consideration Policy a supplementary online quiz will be given.

On successful completion you will be able to:

- Apply linear algebra techniques to determine equilibrium outcomes in macroeconomic models.
- Understand the theory which underlies the techniques learned.

Mid-Semester Test

Due: **9 October 2018**

Weighting: **20%**

Description

This test covers the models and techniques given in the first part of ECON764. It also prepares students for the format and difficulty of the final exam.

Submission

The test will be held during lecture during week 9, 9 October 2018.

Extension

There will be no extensions. In the case of unavoidable circumstances students and a successful application under the Special Consideration Policy a supplementary mid-semester test will be given.

Collecting Marked Tests

Marked tests will be available for collection by the end of week 11 and solutions will be available online.

On successful completion you will be able to:

- Apply linear algebra techniques to determine equilibrium outcomes in macroeconomic models.
- Apply calculus and linear algebra to calculate the comparative statics determined by an economic model.

Assignment

Due: **26 October 2018**

Weighting: **20%**

Description

This assignment gives a selection of problems based mainly on those from the textbook. It covers all the material included in ECON764.

Submission

Answers to the assignment questions should be written on a printed copy of the assignment file available on iLearn. Both an electronic submission and paper submission are required. The completed assignment should be scanned and then uploaded to a link available on iLearn. Both the electronic and paper submission are due by 4:30pm Friday 26 October 2018. The paper submission may be placed under the door of ER4 Room 421 at any time before the submission deadline.

Extension

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 – 20% penalty). This penalty does not apply for cases in which an application under the Special Consideration Policy is made and approved. No submission will be accepted after solutions have been posted.

Collecting Marked Assignments

Marked assignments will be available for collection by the end of week 13 and solutions will be available online.

On successful completion you will be able to:

- Apply linear algebra techniques to determine equilibrium outcomes in macroeconomic models.
- Use the technique of Lagrange multipliers to solve problems in consumer and producer theory.
- Apply calculus and linear algebra to calculate the comparative statics determined by an economic model.
- Understand the theory which underlies the techniques learned.

Final Exam

Due: **Exam Period**

Weighting: **50%**

This examination covers the models and techniques given in throughout ECON764.

Description

This examination covers the models and techniques given in throughout ECON764.

Submission

The test will be held during lecture during the university exam period.

Extension

There will be no extensions. In the case of unavoidable circumstances students and a successful application under the Special Consideration Policy a supplementary final exam will be given.

On successful completion you will be able to:

- Apply linear algebra techniques to determine equilibrium outcomes in macroeconomic models.
- Use the technique of Lagrange multipliers to solve problems in consumer and producer theory.
- Apply calculus and linear algebra to calculate the comparative statics determined by an economic model.

Delivery and Resources

CLASSES:

The unit has 3 hours face-to-face teaching per week. The class meeting will be held on Tuesdays from 6 to 9 p.m.

Required and Recommended Texts and/or Materials Textbook:

Three textbooks will be used, Alpha C. Chiang and Kevin Wainwright, *Fundamental Methods of Mathematical Economics*, Aleskerov, F., H. Ersel, and D. Piontkovski *Linear Algebra for Economists*, and *Introduction to mathematical economics* by Edward T. Dowling. A full electronic copy of *Linear Algebra for Economists* is available from the Macquarie library. *Introduction to mathematical economics* is a Shaum's outline and contains many worked examples.

Useful additional references include a calculus book such as Stewart's *Calculus* and a linear algebra book such as Anton's *Elementary linear algebra* may also be useful as a reference. There is also a linear algebra textbook which can be downloaded from <http://joshua.smcvt.edu/linearalgebra/>

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 shown in *iLearn*, 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](#).

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

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

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

Learning outcomes

- Apply linear algebra techniques to determine equilibrium outcomes in macroeconomic models.
- Use the technique of Lagrange multipliers to solve problems in consumer and producer

theory.

- Apply calculus and linear algebra to calculate the comparative statics determined by an economic model.

Assessment tasks

- Mid-Semester Test
- Assignment
- Final Exam

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

- Apply linear algebra techniques to determine equilibrium outcomes in macroeconomic models.
- Use the technique of Lagrange multipliers to solve problems in consumer and producer theory.
- Apply calculus and linear algebra to calculate the comparative statics determined by an economic model.
- Understand the theory which underlies the techniques learned.

Assessment tasks

- Quiz
- Mid-Semester Test
- Assignment
- Final Exam

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcomes

- Apply linear algebra techniques to determine equilibrium outcomes in macroeconomic models.
- Use the technique of Lagrange multipliers to solve problems in consumer and producer theory.
- Apply calculus and linear algebra to calculate the comparative statics determined by an economic model.
- Understand the theory which underlies the techniques learned.

Assessment tasks

- Mid-Semester Test
- Assignment
- Final Exam