



# ECON241

## Introductory Econometrics

S1 Evening 2014

*Economics*

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#### Disclaimer

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## General Information

Unit convenor and teaching staff

Unit Convenor

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E4A444

Available on iLearn

Credit points

3

Prerequisites

(STAT122 or STAT170 or STAT171 or PSY122) and (ECON110 or ECON111 or BBA103)

Corequisites

Co-badged status

Unit description

This unit introduces some basic econometric techniques employed by economists in the analysis of economic relationships. These techniques are also used extensively in marketing and finance. In addition to its role as a basis for programs of study in economics, marketing and finance, the unit is the foundation econometric unit for students who wish to undertake a program of study in applied econometrics. Topics covered will usually include: estimation and hypothesis testing; simple and multiple regression; prediction; the interpretation and evaluation of regression models, including an elementary discussion of nonlinear modelling, heteroscedasticity, auto-correlation, multicollinearity and specification error; and the use of categorical or qualitative data in regression models. Emphasis throughout the unit is on the application of econometric techniques and the interpretation of estimated results rather than formal theoretical proofs and derivations.

## 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 key statistical concepts, including probability distributions, parameters and estimators, the sampling distribution of an estimator, point and interval estimation,

and hypothesis testing.

Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.

Explain, compare and contrast these concepts, and apply them to an empirical analysis.

Understand the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.

Understand how to use and interpret dummy variables in regression analysis.

Acquire familiarity with an econometric software program.

## Assessment Tasks

Name	Weighting	Due
<u>Tutorial Exercises</u>	10%	Weeks 2-13, in tutorial.
<u>Homework Assignments</u>	20%	Week 5, 9, 11 and 13
<u>Assignment</u>	20%	Week 11, Monday 5pm.
<u>Final Examination</u>	50%	Exam period

## Tutorial Exercises

Due: **Weeks 2-13, in tutorial.**

Weighting: **10%**

Tutorials are worth 10% (1% each). Tutorials will be held in weeks 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12. Best 10 out of 12 assessable tutorials will be counted for final grade. In each assessable tutorial class, students will be given a set of exercises based on the work recently covered in lectures. The answers to the questions must be submitted prior to the end of the class. Students may attempt the exercises **two times** during the class. Students are permitted to consult reference material, and to discuss the questions with the tutor and with other students. The tutorial questions and solutions will be published during the week following each class. Since we need to provide each enrolled student with a working computer, students are only permitted to attend the class in which they are registered. The tutorial exercises require a total of approximately 8 hours of work. Students who do not submit a tutorial exercise in class will be awarded a mark of zero for that particular exercise and will not be permitted to attempt it for credit at a later date. In cases where a student submits a satisfactory Special Consideration application, which explains their non-attendance at a minimum of 3 tutorial classes, and if the student's prior attendance and performance is satisfactory, the weighting of that student's tutorial component will be adjusted accordingly.

Students must bring their Macquarie University campus card to each tutorial and display it in the holder provided. Failure to display a campus card may result in a student being refused access

to the tutorial.

On successful completion you will be able to:

- Understand the key statistical concepts, including probability distributions, parameters and estimators, the sampling distribution of an estimator, point and interval estimation, and hypothesis testing.
- Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.
- Explain, compare and contrast these concepts, and apply them to an empirical analysis.
- Understand the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Understand how to use and interpret dummy variables in regression analysis.

## Homework Assignments

Due: **Week 5, 9, 11 and 13**

Weighting: **20%**

Students will be given four homework exercises each worth 5% of the final grade (20% in total). It is intended that students will work on the homework exercises independently. Students who have clearly colluded 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. The homework exercises are due in weeks 5, 9, 11 and 13 and must be submitted via the iLearn system. The exercises must be submitted online prior to the due date and time. Each exercise may be submitted **two times** prior to the deadline and each attempt has **two hours** time limit. Only the final submission will be marked. Each homework exercise will require approximately 2 hours of work. A few days after the submission of a homework exercise, students will be provided with their mark via the iLearn system. Students who do not submit a homework exercise will be awarded a mark of zero for that exercise. No extensions will be granted. In cases in which a student submits a satisfactory Special Consideration application, which documents incapacitation for at least 3 consecutive days, and if the student has a satisfactory record of attendance and performance in the previous assessment tasks, the weighting of that student's homework component will be adjusted accordingly.

Late homework and tutorial submissions will not be accepted. At the time of the submission deadline, the highest mark recorded by each student to date for that homework task will be recorded. The homework task will remain accessible to students for revision, but the results of any subsequent attempts will not be used in the calculation of the grade. The only exception to this rule will be students who apply for, and are granted, Special Consideration.

On successful completion you will be able to:

- Understand the key statistical concepts, including probability distributions, parameters

and estimators, the sampling distribution of an estimator, point and interval estimation, and hypothesis testing.

- Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.
- Explain, compare and contrast these concepts, and apply them to an empirical analysis.
- Understand the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.

## Assignment

Due: **Week 11, Monday 5pm.**

Weighting: **20%**

There is one assignment in ECON241, due in week 11, 5pm Monday 26 May. The assignment assesses work covered in lectures up to the submission deadline and is worth 20% of the final grade. It must be submitted via the relevant links in iLearn. Only one copy of the assignment should be submitted. Instructions and information about the requirements of the assignment will be provided in class and on iLearn. Students who have clearly colluded 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. No extensions will be granted. Students who have not submitted the assignment prior to the deadline will be awarded a mark of zero, except for cases in which an application for Special Consideration has been made and approved.

On successful completion you will be able to:

- Understand the key statistical concepts, including probability distributions, parameters and estimators, the sampling distribution of an estimator, point and interval estimation, and hypothesis testing.
- Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.
- Explain, compare and contrast these concepts, and apply them to an empirical analysis.
- Acquire familiarity with an econometric software program.

## Final Examination

Due: **Exam period**

Weighting: **50%**

A two hour final examination for this unit will be held during the University examination period. 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 draft and final timetables will be available from <http://www.timetables.mq.edu.au/exam>.

Students who do not sit for the final exam will be awarded a grade of FA (failed absent). The only exception for this rule will occur in cases where the student has been granted special consideration on the grounds of unavoidable disruption. Students who are prevented from sitting the final exam due to illness or unavoidable disruption may wish to consider applying for special consideration. Information about unavoidable disruption and the special consideration process is available at <http://www.reg.mq.edu.au/Forms/APSCon.pdf>. If a supplementary examination is granted as a result of the special consideration process the examination will be scheduled for after the conclusion of the official examination period. If the student does not attend the supplementary examination at the scheduled time, a grade of FA will be awarded

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, the final day of the official examination period.

On successful completion you will be able to:

- Understand the key statistical concepts, including probability distributions, parameters and estimators, the sampling distribution of an estimator, point and interval estimation, and hypothesis testing.
- Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.
- Explain, compare and contrast these concepts, and apply them to an empirical analysis.
- Understand the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Understand how to use and interpret dummy variables in regression analysis.

## Delivery and Resources

### Classes

§ There is a single two-hour lecture each week of semester. There is also a tutorial class held in each week, beginning in week 2.

§ The timetable for classes can be found on the University web site at: <http://www.timetables.mq.edu.au/>

§ Two lecture streams are offered. Students should attend one of these lecture streams only.

§ Students must register in a tutorial class during the first two weeks of semester. After this time, class changes will not be permitted. Since the submission of the tutorials will occur during the tutorial times, it is vital that students are available to attend the tutorial class at their registered time. Because of resource

constraints, and the fact that tutorial work is assessable, students will not generally be permitted to attend a tutorial class other than the one in which they are registered.

§ It will be assumed that students regularly attend lectures.

§ Students are also required to attend at least 8 out of the 11 assessable tutorial classes.

### **Required and Recommended texts and/or materials**

§ Hill, C. H., Griffiths, W. E. and Lim, G. C. (2011) *Principles of Econometrics* (4th ed.) Wiley. This is the main text used in the unit. It is strongly recommended that students purchase a copy. It may be purchased from the Macquarie University Co-op Bookshop. It is also available in the library.

§ Adkins, L. C. (2010) *Using Gretl for Principles of Econometrics* (3<sup>rd</sup> ed.). This book is a free download from <http://www.learneconometrics.com/gretl/ebook.pdf>.

§ A list of prescribed reading will be developed on the website as the unit progresses.

§ Students should download the Gretl datasets from <http://www.learneconometrics.com/gretl.html>. These are the datasets used in examples and exercises in the above two books.

### **Technology Used and Required**

§ The main software package used in ECON241 is Gretl (<http://gretl.sourceforge.net/>). This software is available for use in the E4B computer labs, and may be freely downloaded for use elsewhere. The Microsoft Windows version is available at <http://gretl.sourceforge.net/win32/>. A Mac version is available at <http://gretl.sourceforge.net/osx.html>. Linux users should check their repositories or download the rpm or source from <http://gretl.sourceforge.net/>.

§ 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>).

§ Significant use is made of online material in ECON241. The unit material has been designed for the (free) Firefox web browser (<http://www.mozilla.com/en-US/firefox/upgrade.html>). Other browsers may display the unit material properly, but this cannot be guaranteed.

### **Unit web page**

§ Course material is available on the learning management system (iLearn).

§ Students are strongly advised to check the unit web page regularly for new material and announcements.

## **Unit Schedule**

The unit is taught by lectures, tutorials, homework exercises and quizzes.

Students are expected to attend all lectures and tutorials and to read the specified references after the relevant lecture. Students should download the datasets that are used in the textbook and work through all the relevant examples in chapters. Students should submit the tutorials, homework exercises and quizzes and reflect on the feedback provided.

Approximate Schedule of Topics

Week	Topics
1	Introduction, Review of necessary mathematics.
2	Probability
3	Probability
4	Inference
5	Simple regression
6	Simple regression
7	Prediction, goodness of fit and modelling issues
8	Multiple regression
9	Multiple regression
<b>10</b>	Heteroscedasticity
11	Dynamics and Autocorrelation
12	Dynamics and Autocorrelation
13	Exam review

Schedule of work submission

Weeks	Tutorial	Homework Exercises	Assignment
1			
2	Tutorial 1		
3	Tutorial 2		



4	Tutorial 3		
5	Tutorial 4	Exercise 1	
6	Tutorial 5		
7	Tutorial 6		
8	Tutorial 7		
9	Tutorial 8	Exercise 2	
10	Tutorial 9		
11	Tutorial10	Exercise 3	Assignment
12	Tutorial11		
13	Tutorial 12	Exercise 4	

## Learning and Teaching Activities

### Lectures

There is a single two-hour lecture each week of semester. Two lecture streams are run in parallel – a day stream and an evening stream. Students should attend only one of the two streams.

•The timetable for classes can be found on the University web site at:

<http://www.timetables.mq.edu.au/>

### Tutorials

•Students must enrol in a tutorial class during the first two weeks of semester. After this time, class changes will not be permitted. Since the submission of the tutorials will occur during the tutorial times, it is vital that students are available to attend the tutorial class at their enrolled time. Because of resource constraints, and the fact that tutorial work is assessable, students will not generally be permitted to attend a tutorial class other than the one in which they are enrolled except for tutorials held in weeks 5 and 6. In week 5 Friday March 29 is a Good Friday public holiday, and in week 6 Monday April 1 is a Easter Monday public holiday. For those weeks students whose tutorials are on the public holidays will be allowed to attend a tutorial on a

different day. Tutorial works in weeks 5 and 6 are not assessable. •It will be assumed that students regularly attend lectures. •Students are also required to attend at least 8 out of the 10 assessable tutorial classes.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

Assessment Policy <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Grievance Management Policy [http://mq.edu.au/policy/docs/grievance\\_management/policy.html](http://mq.edu.au/policy/docs/grievance_management/policy.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of 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/support/student\\_conduct/](https://students.mq.edu.au/support/student_conduct/)

## 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](http://www.mq.edu.au/policy/docs/academic_honesty/policy.html)

## Grades

Macquarie University uses the following grades in coursework units of study:

- HD - High Distinction
- D - Distinction
- CR - Credit
- P - Pass
- F - Fail

Grade descriptors and other information concerning grading are contained in the Macquarie University Grading Policy which is available at:

<http://www.mq.edu.au/policy/docs/grading/policy.html>

## 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/new\\_and\\_current\\_students/undergraduate\\_current\\_students/how\\_do\\_i/grade\\_appeals/](http://www.businessandeconomics.mq.edu.au/new_and_current_students/undergraduate_current_students/how_do_i/grade_appeals/)

## Special Consideration Policy

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/policy.html](http://www.mq.edu.au/policy/docs/special_consideration/policy.html)

## 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](http://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](http://ask.mq.edu.au)

## IT Help

For help with University computer systems and technology, visit <http://informatics.mq.edu.au/help/>.

When using the University's IT, you must adhere to the [Acceptable Use 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 key statistical concepts, including probability distributions, parameters and estimators, the sampling distribution of an estimator, point and interval estimation, and hypothesis testing.
- Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.
- Explain, compare and contrast these concepts, and apply them to an empirical analysis.
- Understand the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Understand how to use and interpret dummy variables in regression analysis.
- Acquire familiarity with an econometric software program.

## Assessment tasks

- Tutorial Exercises
- Homework Assignments
- Assignment
- Final Examination

## 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 key statistical concepts, including probability distributions, parameters and estimators, the sampling distribution of an estimator, point and interval estimation, and hypothesis testing.
- Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.
- Explain, compare and contrast these concepts, and apply them to an empirical analysis.
- Understand the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Understand how to use and interpret dummy variables in regression analysis.
- Acquire familiarity with an econometric software program.

## Assessment tasks

- Homework Assignments
- 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 key statistical concepts, including probability distributions, parameters and estimators, the sampling distribution of an estimator, point and interval estimation, and hypothesis testing.
- Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.
- Explain, compare and contrast these concepts, and apply them to an empirical analysis.
- Understand the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Understand how to use and interpret dummy variables in regression analysis.
- Acquire familiarity with an econometric software program.

## Assessment tasks

- Tutorial Exercises
- Homework Assignments
- Assignment
- Final Examination

## Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

## Learning outcome

- Acquire familiarity with an econometric software program.

## Assessment tasks

- Tutorial Exercises
- Homework Assignments
- Assignment

## Research and Practice

- This unit uses research from both internal and external sources.
- This unit gives students practice in applying research findings in tutorials and homework exercises.

## **Teaching Assistant**

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