



# ECON241

## Introductory Econometrics

S3 Day 2017

*Dept of Economics*

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Unit Convenor

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Available on iLearn

Ariadne Katsouras

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Credit points

3

Prerequisites

15cp at 100 level or above including ((STAT150 or STAT170 or STAT171 or PSY122) and (ECON110 or ECON111))

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. 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.

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

Demonstrate familiarity with an econometric software program.

## Assessment Tasks

| Name                          | Weighting | Hurdle | Due                   |
|-------------------------------|-----------|--------|-----------------------|
| <u>Tutorial participation</u> | 10%       | No     | During tutorials      |
| <u>Homework Assignments</u>   | 20%       | No     | 5pm on date mentioned |
| <u>Major Assignment</u>       | 20%       | No     | 15/1/2018             |
| <u>Class Test</u>             | 50%       | No     | 17/01/2018            |

### Tutorial participation

Due: **During tutorials**

Weighting: **10%**

Assessment task 1 will reward marks for participation in your tutorial. Attendance will be recorded in each tutorial. You are expected to be present at least for 8 tutorials out of the 12 tutorials to gain full 10% (1.25% each) participation marks. Failure to attend at least 8 tutorials will negatively impact on your tutorial participation mark.

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 10 hours of work.

If you miss more than 4 tutorials due to an unavoidable disruption/s, you should apply for Special Consideration (see the Special Consideration Policy below). If that application is approved the attendance requirement will be waived for that tutorial or missed tutorial will be covered by a supplementary assessment that could include an oral component. **Please consult BESS for advice on the Special Consideration Policy.**

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.
- Critically evaluate the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Demonstrate familiarity with an econometric software program.

## Homework Assignments

Due: **5pm on date mentioned**

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 Faculty Disciplinary Committee for further action. The homework exercises are due at 5pm on the following dates: **21/12/2017**, **12/1/2018**, **17/1/2018** and **19/1/2018** 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 a two hour 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 have not submitted the task prior to the deadline will be awarded a mark of 0 for the task. The only exception to this rule will be students who apply for and are granted, Special Consideration. A supplementary test in the form of online quiz or a paper based test will be made available to those students at a later date set by the unit convenor.

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.

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.

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.
- Critically evaluate the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Demonstrate familiarity with an econometric software program.

## Major Assignment

Due: **15/1/2018**

Weighting: **20%**

The assignment is due 4 pm Monday, January 15th. The assignment assesses the understanding of the topics covered in lectures up to the submission deadline and is worth 20% of the final grade. Students must submit both a hard copy and an electronic copy of their assignment. The hard copy must be submitted to the Business and Economics Student Services (BESS, E4B106) and the electronic copy must be through iLearn. 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 will be reported to the University Disciplinary Committee for further action. Late assignments will be accepted but will incur a penalty of 10% of the total available marks made from the total awarded mark for each 24 hour period late or part thereof (for example, 25 hours late in submission – 20% penalty). Students who do not submit an assignment will be awarded a mark of zero for that assessment. This penalty does not apply to cases in which an application for Special Consideration is 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.
- Critically evaluate the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Demonstrate familiarity with an econometric software program.

## Class Test

Due: **17/01/2018**

Weighting: **50%**

There is one class test in ECON241. It will be conducted in lectures 4pm Wednesday, January 17th. The test is worth 50% of the final grade. The test will be of 80 minutes duration and will be conducted during the lectures. 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://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration>

If a student satisfies the Special Consideration policy they will be required to complete a supplementary assessment task and this could take the form of an oral task or a supplementary test.

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.
- Critically evaluate the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Demonstrate familiarity with an econometric software program.

## Delivery and Resources

### 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.

Gujarati, D.N., and Porter, D.C. (2010) *Essentials of Econometrics* (4th ed.) McGraw-Hill.

Stock, J.H., and Watson, M.W. (2007) *Introduction to Econometrics* (2nd ed.) Addison-Wesley

§ 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.ht>

**ml.** 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 iLearn page regularly for new material and announcements.

## Unit Schedule

The unit is taught via lectures and tutorials.

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 unit assessment tasks and reflect on the feedback provided.

### Approximate Schedule of Topics

| Lecture | 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                              |
| 10 | Heteroscedasticity                               |
| 11 | Dynamics and Autocorrelation                     |
| 12 | Dynamics and Autocorrelation                     |
| 13 | Class Test                                       |

## Learning and Teaching Activities

### Lectures and Tutorials

The session 3 timetable can be viewed at <http://timetables.mq.edu.au/>. All students attend the same lecture stream (Class 1). There are a number of tutorial classes, and it is important to register for the same class for all tutorials. Tutorial classes are not interchangeable. Your class registration is complete (and correct) once you have registered for all activities (Lectures 1 to 4 and Tutorials 1 to 2), and have registered for the same class for all tutorials. The first week has a slightly different timetable to the next 3 weeks, and the fifth week is slightly different again. Session 3 runs for 5 weeks. The session begins on Monday December 4th 2017 and runs for 2 weeks before a two week break, resuming on Monday January 8th 2018. There are no clashes between lectures and tutorials. It will be assumed that students regularly attend lectures and tutorials.

### 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\\_2016.html](http://mq.edu.au/policy/docs/assessment/policy_2016.html)

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



Complaint Management Procedure for Students and Members of the Public [http://www.mq.edu.au/policy/docs/complaint\\_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy (in effect until Dec 4th, 2017): [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html)

Special Consideration Policy (in effect from Dec 4th, 2017): <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration>

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/)

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

## 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://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](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

### 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 outcomes

- Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests.
- Demonstrate familiarity with an econometric software program.

#### Assessment tasks

- Tutorial participation
- Homework Assignments
- Major Assignment

### 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.

- Critically evaluate the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Demonstrate familiarity with an econometric software program.

## **Assessment tasks**

- Tutorial participation
- Homework Assignments
- Major Assignment
- Class Test

## **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.
- Critically evaluate the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Demonstrate familiarity with an econometric software program.

## **Assessment tasks**

- Homework Assignments
- Major 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.
- Critically evaluate the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Demonstrate familiarity with an econometric software program.

## **Assessment tasks**

- Tutorial participation
- Homework Assignments
- Major Assignment
- Class Test

## **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.