

# ECON361 Economic and Business Forecasting

Semester 2, 2009

*Department of Economics*

## **What is the course about?**

Welcome to ECON361. This is a course in applied forecasting techniques for students with a basic grounding in economic theory and econometrics. There are few areas of business and government activity that are free of the need to plan for the future. Accordingly, if your ambition is to work in a decision-making and/or analytical capacity in the future, then this course will be of direct interest to you.

ECON361 is concerned principally with quantitative forecasting. That is, using scientific principles to make inferences about the future value of a numerical variable of interest. Applications include forecasting the CPI, GDP, interest rates, sales and prices of a firm's products, etc. However, the principles are sufficiently general that the methods you learn in this course may be usefully applied to forecasting most variables for which a reasonable amount of data exist. The emphasis is on the sound application of theory to practical problems, rather than the development of theory from first principles. In addition to attending class and reading the text, you will need to spend a lot of time working on real forecasting problems. The final examination will require you to compute lots of forecasts, conduct tests etc. Few marks will be available to those students who have simply rote learned the lecture notes, without actually practicing on real forecasting problems.

The objective of ECON361 is to produce students who understand the nature of the forecasting problem and can produce sound forecasts for use in business and economic analysis. Many students will never actually generate their own forecasts in their future careers, but will benefit from the unit by being able to recognise forecasting problems in practice, engage others to generate forecasts, and assess the value of their work. On the other hand, many previous students have gone on to work in forecasting roles. If you have similar ambitions then, in addition to getting a good grade in ECON361, you should consider completing more econometrics units, as well as doing some computing and maths.

## **Prerequisites and Assumed Knowledge**

The prerequisites for this course are ECON141 and at least one of ECON200 and ECON201. It is assumed that students have at least a basic knowledge of microeconomics and macroeconomics. Students should also know about random variables, samples, hypothesis tests (t-tests, etc), the regression model, ordinary least squares, the  $R^2$  statistic, and have at least heard of autocorrelation, heteroskedasticity, and multicollinearity. It is understood that students may have completed ECON141 some time ago, and that their knowledge of these concepts may be a little rusty. This is not a problem. Most of these concepts are not used until later in the unit. If you feel you are particularly weak in these areas, reviewing your ECON141 notes during the

first few weeks of the course might make your life a little easier later in the course. You do not need to be an econometric genius to get a distinction in ECON361. The unit is concerned with the sound application of basic theory to practical problems, not with developing complicated theory for its own sake. Many students with average results in ECON141 have excelled in ECON361. Similarly, some students with strong econometrics backgrounds have performed poorly.

In cases where a student does not have ECON141 but has significant successful study in statistics at 200-level or above, a prerequisite waiver **may** be granted upon application to the lecturer-in-charge. However, in general both prerequisites are required to enrol in the unit. The 200-level economics requirement is unlikely to be waived.

The coursework in ECON361 involves considerable use of the computer. In particular, you will need to use Minitab, Excel and Dxdta. These packages are widely used and are quite user-friendly. Lots of examples of their use will be given in lectures, and the tutorials will provide you with exercises to work through under supervision which should clear up any problems you have using the computer. If your computing skills are particularly weak, you might need to plan to spend some extra time in the labs, but you won't be at a particular disadvantage to other students.

### **Lectures and “Tutorials”**

Lectures are held on the Monday of each week of semester from **5pm-7pm** in the E7B-T3. Despite being unenforceable, lecture attendance should be considered compulsory. In the past, students who did not attend lectures regularly have performed very poorly in the assignments and exam. Students who have obviously not attended lectures will not be given any assistance outside class time.

ECON361 does not have any tutorial classes in the traditional sense. The lecture program will contain many worked examples with the necessary data, spreadsheets, etc placed on the unit website after the lecture. The textbook contains many worked examples and each chapter has exercises with detailed solutions at the back of the book. Students are expected to be working through these examples and exercises as the unit progresses. If problems are encountered, help may be sought from the lecturer. Total students numbers in the unit are sufficiently small that this system works well, making multiple tutors and classes unnecessary. ECON361 does however include a set of computer lab sessions which for convenience we will refer to as tutorials. These will be held during the weeks indicated on the last page of this unit outline. During these sessions, students will work through a set of exercises on the computer. A tutor will be present to offer assistance when needed. Students are free to work through the exercises at their own pace. Attendance at tutorials

is not compulsory. If you don't need any assistance with the tutorial exercises, you will be at no disadvantage if you do not attend the tutorial classes. On the other hand, if you think that you need a lot of assistance, you are welcome to attend multiple classes in each week, subject to the availability of space in the labs. Please note however, that you will not be given any help with computer implementation of forecasting techniques outside the tutorials. If you have problems which you do not resolve in class you may find yourself unable to complete the assignment, and your overall performance in the unit may suffer. Please bear in mind that some tutorial sessions will be more crowded than others. Students who need a lot of help are advised to try to attend the less crowded classes, since this will allow the tutor to spend more time helping them.

### **Texts and References**

The recommended textbook for the unit is

Heaton, C. (2009) *A Practical Guide to Economic Forecasting (6th edition)*, Technical Economics.

This may be downloaded from the unit website.

Other texts which may be useful for some parts of the course, and are available in the library, include:

- Hanke, John E. and Arthur G. Reitsch, *Business Forecasting*, Prentice Hall, 5<sup>th</sup> edition
- Makridakis, Spyros and Steven C. Wheelwright, *Forecasting Methods for Management*, John Wiley, 5<sup>th</sup> edition
- Makridakis, Spyros, Steven C. Wheelwright, and Victor E. McGee, *Forecasting: Methods and Applications*, John Wiley, 2<sup>nd</sup> edition
- Newbold, Paul and Theodore Bos, *Introductory Business and Economic Forecasting*, South Western Pub. Co., 2<sup>nd</sup> edition
- Pindyck, Robert S. and Daniel L. Rubinfeld, *Econometric Models and Economic Forecasts*, McGraw Hill, 3<sup>rd</sup> edition
- Wilson, J. Holton and Barry Keating, *Business Forecasting*, Irwin, 2<sup>nd</sup> edition

Depending on how long ago you completed ECON141, it may be useful to keep your 141 notes and textbook on hand for occasional reference.

### **Computing and the ECON361 Web Site**

ECON361 has a unit website. All data used in lectures, all assignments, tutorial exercises, mid-semester test results and announcements will be put on the site as they become available. Most of the website is password-protected to restrict access to currently enrolled ECON361 students. Your username and password

are your standard Macquarie University student username and password. The first time that you log in you should configure your account to forward any messages to the email account that you use. This will be an official form of communication for the unit. If you do not receive messages transmitted via the website promptly, your performance in the unit could be adversely affected.

If you cannot remember your account name or password, or you have any other problem logging in, you should contact the IT helpdesk in the library.

In addition to accessing the website, students will need to use computers to do the tutorials, exercises and assignments. In particular, students will use Excel, Minitab, Dxdata, and Firefox or Internet Explorer. Instructions on the use of these packages will be given in lectures, tutorials and textbook. All these packages are available in the EFS computing labs in E4B. Students who have access to a computer at home or work, may be able to do much of the coursework off-campus.

### **STUDENTS SHOULD HEED THE FOLLOWING WARNING ABOUT THE COMPUTER LABS:**

The Division of EFS spends a large amount of money providing students access to up-to-date computing facilities. However, no amount of money can prevent computers from being computers. Please consider the following advice.

- Continually save your work as you produce it. Computers can crash at any time, but always seem most likely to when you can least afford it.
- Save multiple copies of you work. Make backups of your backups. Storage is cheap – lost work isn't.
- Split your assignments up into several small files. If multiple copies of multiple files are saved to multiple discs, your chances of losing everything are greatly reduced.
- Make sure you have sufficient storage space. There is nothing worse than spending hours working on your assignment and then finding that you don't have enough room to save it.
- Scan for viruses often. It is very difficult to eliminate viruses from the labs. While all viruses are cleared from the labs overnight, the next morning students come back with their infected discs and reintroduce the viruses. Putting your infected discs in computers owned by your friends, parents, employer or lecturer will not make you popular.
- Don't count on being able to get a computer in the labs when you want one. It is often the case that several units will have assignments due in about the

same time. If you leave your assignment too late you might find that you cannot get access to a computer in the labs.

- The computer network often crashes. Sometimes it can simply be rebooted, and sometimes it's a little more difficult than that. If it crashes on Friday afternoon then it is quite likely that it won't be back up until at least Monday morning. If you were planning on doing your assignment the weekend before it was due, then you would have a big problem. This has happened many times in previous years.
- If you think that I'm being paranoid then you must be reading this before you have done the assignment. Few students get through ECON361 without some form of computer trouble. If you plan for disaster, then any problems will be little more than an inconvenience.

### **Teaching Staff**

Chris Heaton (Lecturer-in-charge)	E4A-414	9850-9921	cheaton@efs.mq.edu.au
Daehoon Nahm	E4A-417	9850-9615	dnahm@efs.mq.edu.au

Consultation hours will be put on office doors and on the web site after the start of semester.

### **Getting Help**

#### Academic problems:

At university, students are supposed to learn independently. That is, students attend classes, read the text, do the exercises, identify their problem areas and work through them independently. Indeed, the capacity for independent problem solving is one of the main attractions of university graduates to employers. However, at times you will get stuck. If you have a question about the course material to which you have given some thought, but have been unable to resolve by reading the notes and consulting other references, then the staff are more than happy to help. Students are welcome to drop in or ring up during consultation hours. Many problems can simply be solved by email.

Please note the following:

- Asking questions is no substitute for class attendance and private study. Furthermore, the staff do not have the time to give extensive tuition to individual students outside class hours. If you appear to have been skipping classes or have not read the text closely, then staff reserve the right to

refuse help. Preference will always be given to students who ask intelligent questions which show that they have really thought about the problem at hand. This is not an attempt to discourage students from seeking help. Rather, it's a request for students to take responsibility for their own learning, and to use the teaching staff's help productively.

- There are many students in this unit and few staff. In the weeks before the final exam, mid-semester test and the submission of each assignment, it is often the case that staff receive far more queries from students than they can satisfactorily deal with. It is important that you work continuously throughout the unit and solve problems as they arise, rather than leaving them until the last minute and risking disappointment.

#### Administrative problems:

All administrative matters should be referred to the lecturer-in-charge. Please note the procedures for dealing with special consideration, appeals, and class changes, outlined later in this document.

#### Personal problems:

It is quite common for students to suffer from a range of personal problems during their university studies. If you are suffering from difficulties that you think might affect your performance in the unit, you should consider notifying the lecturer-in-charge. In some cases it might be possible to grant you special consideration. At the very least, we will be able to refer you to someone who can help. The University has a counselling service which employs full-time professionally qualified counsellors who specialise in student issues. The International Office also has ample experience in helping overseas students who are suffering difficulties.

### **Workload**

Please note the following (Macquarie University Calendar 2000, p.326).

*“Class attendance is often only a small proportion of the total work load for a unit: tutorials, laboratory work, reading and research in the Library, writing assignments and study at home are all part of the work involved. It is expected that one credit point in a half-year unit involves, on average, four hours of work each week in that half-year.”*

It is assumed that students in ECON361 are spending an average of twelve hours per week working on the course. Since lectures take only two hours a week and there are only two tutorials, this means that you should be spending an average of almost ten hours per week doing private study for ECON361. The text contains many examples and exercises, as do the textbooks on the

reading list. There are also several thousand interesting data series available on the web and from Dxdata which you can use to practice forecasting. If you really can't think of anything to do, ask a staff member.

### Assessment

Your grade in this course is based on the following:

Assignment	10%
Mid-semester test	10%
Final exam	80%

Students whose performance in the final exam is unsatisfactory will not be considered for a passing grade, irrespective of their performance in the assignments.

**The Assignment:** The assignment is due in on the date indicated below. Late assignments will be accepted but penalised heavily. This may mean that the assignment is recorded as being submitted, but receives no marks. In cases of demonstrable unavoidable misadventure or illness, students may apply **in writing** to the lecturer in charge for a short extension. Students considering applying for an extension should read the section on special consideration below. The assignment questions will be distributed in class and on the website when they become available. **YOU MUST KEEP A PHOTOCOPY OF EVERYTHING YOU HAND IN. IF WE LOSE YOUR ASSIGNMENT WE WILL ASK YOU TO SUBMIT THE COPY AT SHORT NOTICE. IF YOU ARE UNABLE TO DO SO YOU WILL BE COUNTED AS HAVING NOT SUBMITTED AN ASSIGNMENT, EVEN IF IT'S ALL OUR FAULT.**



**ALL ASSIGNMENTS ARE DUE IN BEFORE 5PM ON THE MONDAY OF THE WEEK INDICATED IN THE COURSE OUTLINE (BELOW). THEY MUST BE SUBMITTED IN THE APPROPRIATE BOX IN BUSINESS AND ECONOMICS STUDENT SERVICES (E4B-106). ALL SUBMISSIONS ARE FINAL. SUPPLEMENTS TO, OR REDRAFTS OF ASSIGNMENTS WILL NOT BE ACCEPTED AFTER THE FIRST SUBMISSION.**

**Mid-Semester Test:** The mid-semester test will be of less than one hour duration and will be held in the lecture theatre during the week shown on the last page of this outline. The format will be closed book multiple choice.

**The Final Exam:** The final exam is a three hour closed book test which covers the entire unit. It includes a multiple choice section and three written sections.

### **Plagiarism**

The assignment in ECON361 is intended to be as much a learning exercise as an assessment tool. Accordingly, students are encouraged to discuss their ideas about the assignment. However, the assignment that you submit must be your own work. The University's rules about plagiarism will be enforced in this unit.

The Academic Senate in September 1992 adopted the following definition of plagiarism.

*Plagiarism involves using the work of another person and presenting it as one's own. Any of the following acts constitutes plagiarism unless the source of each quotation or piece of borrowed material is clearly acknowledged.*

- a. copying out part(s) of any document or audio-visual material (including computer-based material);*
- b. using or extracting another person's concepts, experimental results, or conclusions;*
- c. summarising another person's work;*
- d. in an assignment where there was collaborative preparatory work, submitting substantially the same final version of any material as another student.*

*Encouraging or assisting another person to commit plagiarism is a form of improper collusion and may attract the same penalties which apply to plagiarism.*

In ECON361 students are sometimes at risk of violating part d of this definition. Students who submit what is essentially the same assignment, either in whole or in part, will be referred to the Director of Undergraduate Studies for further action, even if the precise wording and presentation of the assignments differ. Even without the draconian penalties imposed by the University, there is little point in committing acts of plagiarism in the assignment. Students who do not pass the final exam will not be considered for a passing grade, irrespective of their performance in the assignments. Furthermore, if a student's assignment mark is substantially better than their mark in the corresponding section of the final exam, then the assignment mark will be discounted in the awarding of the final grade. Ultimately you are better off bombing the assignment, getting some feedback from the marker, and attaining a better final exam mark as a result, than you are cheating in an attempt to inflate your within-semester assessment.

### **The unit requirements**

To be considered for a passing grade in ECON361 you must:

1. Submit what the lecturer-in-charge regards as a reasonable attempt at the assignment.
2. Sit the mid-semester test (or be granted special consideration).
3. Sit for **and pass** the final exam.

From time to time, notices will be placed on the web site listing students for whom we have marks recorded for the various assessment tasks in the unit. It is your responsibility to check that we have correctly recorded the marks for all the assessments that you have submitted. Students who do not satisfy the first two requirements above, may be excluded from the unit prior to the final exam at the discretion of the lecturer-in-charge.

### **Special Consideration**

Requests for special consideration for within-semester assessment tasks should be made in writing to the lecturer-in-charge. Requests for special consideration for the final exam should be made via the Student Centre. All requests should clearly state the nature of the problem, how it affected, or will affect, your performance, and should include all relevant documentation such as a Professional Authority Form. Special consideration will only be granted in cases where the student has suffered a significant, unavoidable misadventure or

illness which has interrupted previously satisfactory work. In the case of the final exam, students must argue that, had the misadventure not occurred, in all likelihood they would have attained a higher grade. The easiest way to do this is to have a good performance in the mid-semester test and assignment. Please note that the onus of proof is on you. Your application must be supported by all reasonable evidence. The decision of the lecturer-in-charge is final. Students who make requests for special consideration on trivial or ridiculous grounds may find that a higher standard of proof is applied to any future requests for special consideration.

#### The Assignment:

Students will be given plenty of time in which to complete the assignment and should use this time wisely. Trivial or short-term illnesses and misadventures immediately prior to the submission deadline are generally not considered sufficient grounds for an extension. Accordingly, students should not leave the assignment until the last minute. Computer malfunction or unavailability is not generally accepted as grounds for special consideration. Students should read the above warnings about computer problems in the labs. Computers crash, floppy discs destroy files, the labs may be crowded or closed due to network problems, etc. These things are not unforeseeable, nor are their consequences entirely unavoidable.

#### The Mid-Semester Test:

Students should always attempt to sit the mid-semester test if possible. If illness or misadventure has significantly affected your preparation, or prevents you from completing the test, then you may apply for special consideration. The fact that you have sat the test will not prejudice your case. There is no supplementary for the mid-semester test. Students who miss the test and are granted special consideration will have their mid-semester test mark set equal to their final exam mark.

#### The Final Exam:

Students should always attempt to sit the final exam if possible. If illness or misadventure has significantly affected your preparation, or prevents you from completing the exam, then you may apply for special consideration. The fact that you have sat the exam will not prejudice your case and may work in your favour if your exam mark is satisfactory. Students who are granted special consideration may be required to sit a supplementary exam. The granting of supplementary exams is not subject to negotiation and may occur even if you have passed the final exam. If you are not prepared to sit a supplementary exam then you should not apply for special consideration. The supplementary exam will be harder than the final exam and/or will be marked to a higher standard. In cases where a student has sat both the final and supplementary exams, the

mark from the supplementary will be used to assign a grade. Special consideration for the final exam will not be granted in cases where a student's within-semester performance is unsatisfactory.

### **Appeals**

If you feel that an error has occurred in the marking of your work or the assignment of your grade then you may appeal in writing to the lecturer-in-charge. Such appeals should be made as soon as possible. Appeals will only be granted in cases where the student presents a reasonable argument that a mistake may have occurred. If your appeal is accepted then the work will be re-marked. Please note that it is possible for a re-mark to result in a **lower** mark.

#### The Assignment:

Students who wish to appeal their assignment mark should write to the lecturer-in-charge promptly clearly stating why they think the marker has made an error, and including their assignment. After all the cases are considered, the assignments will be available for collection from ERIC. In cases where the appeal has been successful the assignment will have been re-marked. It is only worthwhile appealing if you have reason to believe that the marker has made a grievous error. Deviations of a couple of marks will not affect your final grade, and claims that one or two extra marks should have been awarded will generally be rejected even if they are valid. You must state your case fully in your appeal letter. Students are responsible for the legibility of their assignments. Students will not be penalised specifically for poor grammar, spelling, presentation, etc, but the marker will not read the assignment twice in an attempt to understand something which has been poorly written. This may result in a loss of marks. If the lecturer-in-charge agrees that the fault lies with the student, then appeals against such a loss of marks will be unsuccessful.

#### The Mid-Semester Test:

The mid-semester test is marked by computer and it is difficult to see how it can make an error in the marking of a single paper. Nonetheless, if you feel that a mistake has occurred you may appeal in writing to the lecturer-in-charge. Please note that it is the responsibility of the student to ensure that all the relevant information has been correctly recorded on the test sheet, and the answers marked so that the machine is able to read them when functioning correctly. Students who fail the test because they didn't fill in the sheet properly have no recourse.

## The Final Grade:

For information about appeals against final grades, see [http://www.efs.mq.edu.au/current/ug/admin\\_central/special\\_consideration](http://www.efs.mq.edu.au/current/ug/admin_central/special_consideration).

Students should note that the Standardised Numerical Grade (SNG) that they are awarded is **not** the sum of the marks that they received in the various components of the unit. Students are awarded letter grades (F, PC, P, C, D, HD, etc) according to the definitions of these grades in the University Handbook of Undergraduate Studies. SNGs are then awarded so as to reflect a student's ranking within a grade. Consequently, it is not possible to deduce your raw examination mark from your SNG. Students who are awarded a SNG of 44 and argue that "I only failed by one mark", do not understand the grading system. In particular, it should be noted that all units but those with the smallest enrolments have students who enrol, but do not participate in the unit or submit assessment tasks. These students are awarded an F and will generally be ranked below students who made a serious attempt, submitted all assessment tasks, but failed through poor performance. Consequently, students who have participated in the unit but failed, will tend to have SNGs in the 40s simply by virtue of the fact that some other students did nothing. Considerable care is taken when grading students who participate in the unit, but fail through poor performance. If your SNG is in the 40s, it is quite likely that your examination scripts were read several times and a great deal of thought was given to whether you could be awarded a PC. We are aware of the consequences of academic failure and do not take our grading responsibilities lightly.

## Unit Schedule

The intended schedule for the unit is as follows. It is possible that the timing of topics may deviate slightly from this schedule.

Week	Date	Lecture Topic
1	3 <sup>rd</sup> August	Introduction
2	10 <sup>th</sup> August	Decomposition Methods
3	17 <sup>th</sup> August	Smoothing techniques
4	24 <sup>th</sup> August	Smoothing techniques
5	31 <sup>st</sup> August	ARIMA models
6	7 <sup>th</sup> September	ARIMA models
7	14 <sup>th</sup> September	ARIMA models
<b><i>Mid-Semester Break</i></b>		
8	5 <sup>th</sup> October	<b><i>Long Weekend – no classes</i></b>
9	12 <sup>th</sup> October	ARIMA models
10	19 <sup>th</sup> October	Vector Autoregression <b><i>Mid-Semester Test</i></b>
11	26 <sup>th</sup> October	Vector Autoregression <b><i>Assignment due</i></b>
12	2 <sup>nd</sup> November	Vector Autoregression
13	9 <sup>th</sup> November	Vector Autoregression