MACQUARIE UNIVERSITY
DIVISION OF ECONOMIC AND FINANCIAL STUDIES

ECON141 - INTRODUCTORY ECONOMETRICS
Second Semester 2006

UNIT OUTLINE

1. Overview of ECON141

The aim of ECON141 is to acquaint students with econometric techniques frequently used in the analysis of economic, financial and marketing data. A basic level of competence in using these techniques, together with an appreciation of their strengths and limitations, is essential for economists, financial analysts and market researchers.

The unit builds on statistical techniques covered in STAT170 (Introductory Statistics) with emphasis given to applications in economics, finance and marketing. Mathematical proofs and derivations are considered only to the extent necessary to facilitate an understanding of key concepts and the interpretation of results.

During the semester students will be required to use the computer program Microsoft EXCEL. The use of this computer program is an integral component of tutorial exercises and the assignment. Instruction in the use of the computer program will be given in lectures, tutorials and practicals as required. The computing component of the unit is not examinable in the mid-semester tests or end-of-semester examinations.

2. Prerequisites

ECON141 has two prerequisites. Students must have obtained at least a Pass in

(i) STAT170 or STAT171; and

(ii) ECON110 or ECON111.

3. Text

The prescribed text for the unit is:

D. Gujarati
Essentials of Econometrics
Third edition, McGraw Hill, 2005

Students for whom ECON141 is a terminating unit in econometric and statistical techniques, or who require a basic, introductory, non-technical discussion of the material covered in ECON141 can purchase the following book additionally:

Harrison, S.R., and R.H.V. Tamaschke
Statistics for business, economics and management
Prentice Hall, 1993

The text and lecture notes, together with the lectures and additional references, will provide students with a clear indication of the basic content of the unit.

Lecture Slides

Copies of the Lecture Slides used in ECON141 (**ECON141 Lecture Notes for the <u>Second Semester</u> 2006**) can be purchased in the Union Bookshop. These notes also include additional applied topics. Because the lectures will use those slides, it is recommended that students bring the Lecture Notes to the lectures. It should be emphasised that additional transparencies will also be used in the lectures and thus it is imperative that students attend the lectures. Please note that the lecture notes used in the second semester are different from those for the first semester.

4. Reference books

There are a number of introductory econometrics books including the following:

Bechtold, B., and R. Johnson
Statistics for business and economics
PWS-Kent, 1989

5. Class Arrangements

Students are required to attend thirty four hours of lectures (i.e. three hours each week minus two hours on the Labour Day holiday), seven one-hour tutorials and two one-hour computing practicals. Non-attendance at lectures, tutorials and practicals is the surest way to guarantee failure.

Lectures:	**Day Stream**	Monday 1 pm - 3 pm	W5B, Macquarie Theatre
		Thursday 4 pm - 5 pm	W5B, Macquarie Theatre
	Evening Stream		
		Monday 6 pm - 8 pm	C5C-T2
		Thursday 7 pm -8 pm	C5C-T1

Tutorials/Computing Practicals:

Tutorial Classes:	Weeks 3, 4, 7, 10, 11, 12 and 13.
Computing Practicals:	Week 5 (supervised), Week 6 (unsupervised)

All computing practicals will be held in **E4B 208**.

The tutorial arrangements and topics covered in these tutorials are indicated on the Course Calendar at the end of this study guide.

Tutorial/Computing Practical groups and tutorial locations will be posted on the unit homepage.

6. Tutorial/Practical Exercises

The Tutorial/Practical Exercises program commences in Week 2. Students are required to attempt tutorial and/or computing exercises in weeks 2, 3, 4, 5, 6, 7, 8, 10, 11, 12 and 13. No tutorial or computing exercises have been set for Weeks 1 and 9.

Formal Tutorial classes and Computing practicals commence in week 3, and except for weeks 6, 8, and 9 continue till week 13. **There are no tutorial classes or supervised computing practicals in weeks 1, 2, 6, 8, and 9.**

Students are expected to be able to complete the tutorial and computing exercises set for weeks 2, 6, and 8 without assistance from tutors. The solutions for these exercises will be made available from the web page. Students may discuss any issues or difficulties that they have arising from these exercises with staff during office consultation hours.

Students should attempt as many exercises as possible before the tutorial sessions so that they may more effectively benefit from the discussion. It is important that students be in a position when they attend tutorials to indicate which aspects of the exercises should be given priority.

Students are strongly advised to attend tutorials. The best advice that can be given to an ECON141 student is to attend lectures and tutorials, and to attempt the tutorial exercises before attending tutorials and before looking at the solutions.

7. Supplementary Exercises

Additional Exercises have been set for weeks one through eleven. Answers will be made available from the unit homepage at the end of the same week. These exercises vary from being just drill exercises to more challenging exercises. They should help all students with additional practice.

8. Quizzes

From week 3 students will be able to try out their econometric skills on our online quizzes. Refer to the Quizzes handout for additional information.

Quizzes are compulsory in 2006: they count towards 5% of the total course mark. There are 9 quizzes to complete, each is of an equal weight (i.e., each counts towards (5/9)% of the total course mark). Each one of them will be available for a period of four weeks from the time they can first be accessed.

9. Assessment

(a) Two one-hour multiple-choice tests will be held on

Day Stream	Thursday September 7 2006 (week 6) **and**
	Thursday October 26 2006 (week 11) from 4 to 5pm.
Evening Stream	Thursday September 7 2006 (week 6) **and**
	Thursday October 26 2006 (week 11)) from 7 to 8pm.

(b) One assignment due on Wednesday October 11, 2006 (week 9) by 5pm.
(c) The online Quizzes.
(d) A three hour end-of-semester examination.

The Mid-Semester tests are worth 14% (7% each) and the Assignment is worth 7% of the total course mark. The quizzes are worth 5% and the Final exam is worth 74% of the total course mark.

(a) The **MULTIPLE-CHOICE TESTS** will be conducted in the normal lecture time on Thursday in weeks 6 and 11. Each test will be of approximately 45 minutes duration and attendance is compulsory. There will be no catch-up or supplementary tests. Students who experience serious misadventure and are unable to attend either test should submit a letter with appropriate documentary evidence to the Tutor in Charge, as soon as possible.

(b) The assignment will be marked and is worth 7%.

(c) The **FINAL EXAMINATION** (3 hours) will consist of two components:

(i) Multiple-choice questions (approximately 40%);
(ii) "Long" answers (approximately 60%).

To pass ECON141, students must satisfy all four separate requirements:
(1) Submit a satisfactory assignment;
(2) Perform satisfactorily in the multiple-choice tests;
(3) Perform satisfactorily in the online quizzes;
AND
(4) PASS THE FINAL EXAM. (Of the four requirements, the final examination is the most important.)

Even if a student's overall mark out of 100% is satisfactory, the student will NOT pass the course if he/she does not pass the final exam.

Under the current grading system, a standard numerical grade (SNG) will be awarded together with a band grade HD, D, Cr, P, PC or F.

It is important for students to note that the SNGs are NOT the weighted average of the raw marks for the above four assessment components. They are rather a **detailed grade** based on the marks obtained from all facets of the unit assessment. As such, a grade just below the threshold for the next band grade up does not necessarily mean that the aggregate mark is just below the threshold but it means that the overall performance is better than most of the other students in the same band grade but not quite good enough to warrant the next grade up.

10. Lecture Program

Topics	Reference in Gujarati	Reference in Harrison & T
The Role of Econometrics in Economic Analysis	**Chapter 1**	
Basic Statistical Concepts: A Review		
1. Random variables	**2.3**	**2.1, 2.2, 2.4**
2. Probability density function	**2.5**	
3. Rules of summation	**2.1**	**3.1, 3.2**
4. Mean of a random variable	**3.1**	
5. Variance of a random variable	**3.2**	**4.1, 4.2, 4.3**
6. Standard deviation of a random variable	**3.2**	
7. Populations and samples	**2.2, 3.7**	**5.2, 5.3, 5.4.4**
8. Normal distribution	**4.1**	
9. t-distribution (using the t tables)	**4.2**	**6.1, 6.2, 6.3**
Statistical Inference		
1. Statistical Inference	**5.1**	**7.3.1, 7.3.3**
2. Estimation of Parameters: Point vs. Interval	**5.3**	**7.4.1-7.4.3,**
3. Hypothesis Testing	**5.5**	
4. Properties of Point Estimators	**5.4**	**8.1-8.5**
The Two-Variable Regression Model		
1. Purpose	**6.1**	**9.2, 9.3, 9.4,**
2. Assumptions		**9.5, 9.7.1**
3. The error term	**6.4**	
4. Population and sample regression	**6.5**	
5. Least squares estimates	**6.8**	
6. Interpretation of the coefficients	**6.8**	
7. Elasticities		
8. Prediction	**7.11**	
Properties of Least Squares Estimators		
1. Mean and variance of the LS estimators	**7.3**	**9.6.1**
2. Gauss Markov Theorem	**7.3**	**9.6.2**
3. Probability distribution of the LS estimators	**7.4**	
Inference in the Simple Linear Regression Model		
1. Confidence intervals for the coefficients of the regression model	**7.5**	**9.6.3** **9.7.3**
2. Hypothesis testing	**7.5**	
3. Prediction intervals	**7.11**	
Analysis of Variance and Coefficient of Determination in the Two-Variable Model		
1. Analysis of Variance	**7.6**	**9.6.4**
2. Coefficient of determination	**7.6**	**9.8**
3. Sample correlation coefficient	**7.6**	**9.9**
4. Comparing correlation and regression analysis	**7.6**	
5. Reporting regression results.	**7.7**	

Functional Forms of Regression Models 1. Introduction to Functional Forms. 2. Log-Linear (log-log or double log) Models: Measuring Elasticity 3. Linear vs. Log-Linear Models		**10.5**
The Multiple Regression Model 1. Assumptions 2. Interpretation of the coefficients 3. LS estimation 4. Probability distribution of the LS estimators 5. Interval estimation **Hypothesis Testing in the Multiple Regression Model** 1. Student-t Tests 2. Goodness-of-Fit 3. F-Tests 4. ANOVA Table 5. Non linear functional forms: log-log and polynomials models 6. Prediction **Multicollinearity** 1. The nature of multicollinearity 2. Effects of multicollinearity 3. Identifying multicollinearity 4. Mitigating multicollinearity **Dummy Variables** 1. Intercept dummy variables 2. Slope dummy variables 3. Different intercepts & slopes 4. Testing for the existence of a qualitative effect. 5. Testing for a structural break 6. Seasonal Dummy variables	**8.1, 8.2** **8.2** **8.3** **8.3** **8.7** **8.6, 8.7** **4.5** **8.8** **8.8** **9.1, 9.2, 9.3, 9.7** **12.1, 12.2** **12.3, 12.4** **12.5** **12.8** **10.1, 10.2** **10.2** **10.2** **10.2** **10.5** **10.6**	**10.1, 10.2** **10.3** **10.5** **10.6** **10.4**
Heteroscedasticity 1. The nature of heteroscedasticity 2. The consequences of heteroscedasticity 3. Detecting heteroscedasticity **Autocorrelation** 1. The nature of autocorrelation 2. The consequences of autocorrelation 3. Detecting autocorrelation: Durbin Watson test **Model Specification** 1. Formulating a Model 2. Attributes of a Good Model 3. Types of Specification Errors 4. Detecting Specification Errors 5. Summary	**13.1** **13.2** **13.3** **14.1** **14.2** **14.3** **11.1** **11.1** **11.2** **11.3** **11.8**	**10.7.2** **10.7.1**

11. Workload

Students are expected to devote twelve hours each week to ECON141, including attendance at Lectures, Tutorials and Computing Practicals.

12. Calculators

Some numerical calculations may be required in the examinations. A basic calculator is all that will be required to carry out these calculations. Students will be permitted to take **non-programmable calculators only** into the ECON141 examinations.

13. ECON141 Web Page

The web page for Econ141 can be accessed through WebCT:

http://online.mq.edu.au/

On this page students will find links to the assignments, the tutorials, announcements and a message/discussion board. Students are expected to check the web page frequently for new announcements or course material.

14. Staff

Lecturers:

Weeks 1-5
Roselyne Joyeux E4A 527 Ph: 9850 8487
Email: rjoyeux@efs.mq.edu.au

Weeks 6-9
Michael Dobbie E4A 416 Ph: 9850 8502
Email: mdobbie@efs.mq.edu.au

Weeks 10-13
Daehoon Nahm (LIC) E4A 525 Ph: 9850 9615
Email: dnahm@efs.mq.edu.au

Tutor in Charge:

Rebecca Reeve E4A 420 Ph: 9850 8495
Email: rdreeve@efs.mq.edu.au

For administrative (non-academic) enquiries, please contact the following staff:
Michael Munoru E4A 449 Ph: 9850 8409
Email: mmunoru@efs.mq.edu.au

Students are encouraged to consult staff during consultation hours. Details of consultation times are displayed on office doors of staff and will be announced in lectures.

2006 COURSE CALENDAR - ECON141

Week No. Commencing	Lecture Topic	Tutorials and Coursework
1 July 31	The Role of Econometrics in Economic Analysis Revision of Basic Statistical Concepts	
2 August 7	Statistical Inference	Tutorial Week 2
3 August 14	Two-variable Regression Analysis Properties of Least Squares Estimators	Tutorial Week 3 Tutorial solutions discussed in formal tutorial
4 August 21	Inference in the Simple Linear Regression Model Analysis of Variance and Coefficient of Determination in the Two-variable Model Computing in ECON141	Tutorial Week 4 Tutorial solutions discussed in formal tutorial
5 August 28	Functional Forms of Regression Models Test 1 Review	Tutorial Week 5 Computing Practical
6 September 4	The Multiple Regression Model **MULTIPLE CHOICE TEST NO. 1 (September 7)**	Tutorial Week 6
7 September 11	Hypothesis Testing in the Multiple Regression Model	Tutorial Week 7 Tutorial solutions discussed in formal tutorial
MID-SEMESTER BREAK: SATURDAY SEPTEMBER 16 TO MONDAY OCTOBER 2		
8 October 3	Multicollinearity	Tutorial Week 8
9 October 9	Dummy Variables Heteroscedasticity	**ASSIGNMENT DUE ON Wednesday October 11**
10 October 16	Autocorrelation Review Test 2	Tutorial Week 10 Tutorial solutions discussed in formal tutorial
11 October 23	Autocorrelation Model Specification **MULTIPLE CHOICE TEST NO. 2 (October 26)**	Tutorial Week 11 Tutorial solutions discussed in formal tutorial
12 October 30	A case study: the construction department at Croq' Pain	Tutorial Week 12 Tutorial solutions discussed in formal tutorial
13 November 6	Working through an old final Overview and Revision	Tutorial Week 13 Tutorial solutions discussed in formal tutorial