

**ECON141 - INTRODUCTORY ECONOMETRICS**  
**Second Semester 2008**

**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 may also find the following book helpful:

Harrison, S.R., and R.H.V. Tamaschke

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.

#### **4. Lecture Slides**

Copies of the Lecture Slides used in ECON141 (**ECON141 Lecture Notes for the Second Semester 2008**) 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.

#### **5. Class Arrangements**

Students are required to attend thirty seven hours of lectures/tests (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.

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

#### **Tutorials/Computing Practical:**

Tutorial Classes:	Weeks 3, 4, 7, 10, 11, 12 and 13.
Computing Practical:	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. Assessment

- (a) Two one-hour multiple-choice tests will be held on
  - Day Stream** Thursday September 11 2008 (week 6) **and**  
Thursday October 30 2008 (week 11) from 4 to 5pm.
  - Evening Stream** Thursday September 11 2008 (week 6) **and**  
Thursday October 30 2008 (week 11)) from 7 to 8pm.
- (b) One assignment due on Wednesday October 15, 2008 (week 9) by 5pm
- (c) A three hour end-of-semester examination.

The Mid-Semester tests are worth 20% (10% each) and the Assignment is worth 10% of the total course mark. The final examination is worth 70% of the total 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 10%.
- (c) The **FINAL EXAMINATION** (3 hours) will consist of two components:
  - (i) Multiple-choice questions (approximately 40%);
  - (ii) “Long” answers (approximately 60%).

Students must bring their own non-programmable calculator and student ID card to the mid-semester tests and the final examination.

To pass ECON141, students must attain a satisfactory overall aggregate mark and also pass the final examination. **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.

## 9. Lecture Program

Topics	Reference in Gujarati
<b>The Role of Econometrics in Economic Analysis</b>	<b>Chapter 1</b>
<b>Basic Statistical Concepts: A Review</b>	
1. Random variables	2.3
2. Probability and probability distributions	2.4,2.5
3. The summation operator	2.1
4. The expectation operator	3.1
5. Mean of a random variable	3.1
6. Variance and standard deviation of a random variable	3.2
7. Covariance and correlation coefficient	3.3,3.4
8. Population and sample	2.2, 3.7
9. Normal distribution	4.1
10. t-distribution (using the t tables)	4.2
<b>Statistical Inference</b>	
1. Statistical Inference	5.1,5.2
2. Estimation of Parameters: Point vs. Interval	5.3
3. Properties of Point Estimators	5.4
4. Hypothesis Testing	5.5
<b>The Two-Variable (or Simple) Regression Model</b>	
1. The meaning of regression	6.1
2. Model and assumptions; simple and multiple regression	6.2,6.6,6.7,7.1
3. The error term	6.3,6.4
4. Population and sample regression	6.5
5. Ordinary Least squares (OLS) estimation	6.8
6. Interpretation of the coefficients	6.9,6.10
7. Elasticities	9.1
8. Prediction	7.11
<b>Properties of Least Squares Estimators</b>	
1. Mean, variance and standard error of OLS estimators	7.2,7.3
2. Gauss Markov Theorem	7.3
3. Probability (or Sampling) distribution of the OLS estimators	7.4
<b>Inference in the Simple Linear Regression Model</b>	
1. Confidence intervals for the coefficients of the regression model	7.5
2. Hypothesis testing	7.5
3. Prediction intervals	7.11
<b>Analysis of Variance and Coefficient of Determination in the Two-Variable Model</b>	
1. Analysis of variance (ANOVA)	7.6
2. Coefficient of determination, $R^2$ (goodness of fit measure)	7.6
3. Sample correlation coefficient and $R^2$	7.6
4. Comparing correlation and regression analysis	7.6
5. Reporting regression results.	7.7,7.10

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

## 10. Workload

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

## 11. 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.

## 12. ECON141 Web Page

The web page for Econ141 can be accessed through WebCT:

**<http://learn.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.

## 13. Staff

### Lecturers:

#### Weeks 1-4, 9-13

Daehoon Nahm (LIC)      E4A 525      Ph: 9850 9615  
Email: [dnahm@efs.mq.edu.au](mailto:dnahm@efs.mq.edu.au)

#### Weeks 5-8

Chris Heaton      E4A 526      Ph: 9850 9921  
Email: [cheaton@efs.mq.edu.au](mailto:cheaton@efs.mq.edu.au)

#### Tutor in Charge

Rebecca Reeve      E4A 420      Ph: 9850 8495  
Email: [rdreeve@efs.mq.edu.au](mailto:rdreeve@efs.mq.edu.au)

For administrative (non-academic) enquiries, please contact the following staff:

Prashan Karunaratne      E4A 449      Ph: 9850 8409  
Email: [pkarunar@efs.mq.edu.au](mailto:pkarunar@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 the unit homepage.

## 2008 COURSE CALENDAR - ECON141

Week No. Commencing	Lecture Topic	Tutorials and Coursework
<b>1</b> August 4	The Role of Econometrics in Economic Analysis Revision of Basic Statistical Concepts	
<b>2</b> August 11	Statistical Inference	Tutorial Week 2
<b>3</b> August 18	Two-variable Regression Analysis Properties of Ordinary Least Squares Estimators	Tutorial Week 3 Tutorial solutions discussed in formal tutorial
<b>4</b> August 25	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
<b>5</b> September 1	Functional Forms of Regression Models Review for Test 1	Tutorial Week 5 Computing Practical
<b>6</b> September 8	The Multiple Regression Model <b>MULTIPLE CHOICE TEST NO. 1 (September 11)</b>	Tutorial Week 6
<b>7</b> September 15	Hypothesis Testing in the Multiple Regression Model	Tutorial Week 7 Tutorial solutions discussed in formal tutorial
<b>MID-SEMESTER BREAK: SATURDAY SEPTEMBER 20 TO MONDAY OCTOBER 6</b>		
<b>8</b> October 7	Multicollinearity	Tutorial Week 8
<b>9</b> October 13	Dummy Variables Heteroscedasticity	<b>ASSIGNMENT DUE ON Wednesday October 15</b>
<b>10</b> October 20	Heteroscedasticity Review for Test 2	Tutorial Week 10 Tutorial solutions discussed in formal tutorial
<b>11</b> October 27	Autocorrelation Model Specification <b>MULTIPLE CHOICE TEST NO. 2 (October 30)</b>	Tutorial Week 11 Tutorial solutions discussed in formal tutorial
<b>12</b> November 3	Autocorrelation A case study: the construction department at Croq' Pain	Tutorial Week 12 Tutorial solutions discussed in formal tutorial
<b>13</b> November 10	Working through an old final Overview and Revision	Tutorial Week 13 Tutorial solutions discussed in formal tutorial