

School of Economics and Finance

## QUAN 201 INTRODUCTION TO ECONOMETRICS

Trimester One 2008

### COURSE OUTLINE

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#### Contact Details

Lecturer/Course Coordinator: Dr Mohammed Khaled  
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Email: Mohammed.Khaled@vuw.ac.nz

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#### Class Times and Room Numbers

Lectures:	Wednesdays	2:40-4:30	Rutherford House Lecture Theatre 3 (RHLT3)
	Thursdays	9:30-10:20	Government Building Lecture Theatre 4 (GBLT4)

#### Tutorials

Two-hour tutorials/computer lab sessions will begin in the *second week* of the trimester. In these sessions, held in a computer laboratory (RWW202), you will get an opportunity to apply the material taught in lectures of the previous week. Each tutorial session will usually include a brief introduction to the tutorial by the tutor. The tutorial exercises accompanied by detailed notes on how to do them can be downloaded from the Blackboard, <http://www.blackboard.vuw.ac.nz>

You will be allocated to one of these tutorials on the basis of your preferences asked for during the first lecture session. Days and times of the tutorials, and the tutorial allocation will be announced through the Blackboard website at the end of that week.

Access to the computing laboratories is managed by the Information Technology Services (ITS). Access is unrestricted during weekdays (if the labs are not booked), and available using student ID cards at weekends and after 6pm on weeknights. You will need to enter your ITS *username* (shown on your Confirmation of Study Form) and *password* (initially, your student ID number) to log on. *Make sure that these are operational before the tutorials begin.* For any help in this matter, go to an ITS helpdesk: Rankine Brown building (level 2) or Murphy building (level 2) if at Kelburn Campus, or Government Building (level 1 Law library) or Railway West Wing (level 2) if at Pipitea Campus. Laser printing is possible from all labs; check with an ITS helpdesk for the payment procedure to be followed. You will usually be using your H: drive for your lab work. As a backup, you can also save it on your own floppy (or CD or USB).

The final examination of this course will be held during the Examination Period (6-25 June 2008).

## Course Objectives

The course is designed to give students experience of using statistical methods important in economics and other business subjects, and to build skill and confidence in the use of those methods. It provides skills in regression essential for understanding much of the literature of economics, finance, and empirical studies in other areas of business.

We begin with an introduction to the nature of empirical studies in economics and business. The simple regression and multiple regression models are then treated in depth and in a range of applications in both lectures and tutorials. Careful attention is given to model assessment, choosing a model, and departures from the standard assumptions. The tutorial programme has been designed to give hands on experience with these methods. Assignments consolidate this learning process by giving a opportunity to formulate models and interpret empirical results independently of lecturer or tutor intervention.

At the end of the course students should be able to use regression models in many different applications, and to critically examine reported regression results in empirical research in economics and other business studies. They will be able to identify and deal with a number of statistical problems in the analysis of time series and cross-section data, and will have experience of a range of other important statistical methods. Achievement of these objectives is tested in the case of simple regression by the mid-trimester test (held in lecture week 7), and in the case of multiple regression by the final examination (held during the Examination Period in June 2008).

## Course Content

A provisional lecture outline appears at the end of this course outline.

## Expected Workload

On average, you will need to devote about 17 hours per week to this course:

Lectures:	3 hours
Tutorial/Lab:	2 hours
Reading/Reviewing:	10 hours
Assignments:	2 hour

## Readings

The textbook that you should have is *Introduction to Modern Econometrics with Applications*, by **M. Khaled**, Pearson/Prentice-Hall, 2008. Other useful (but not required) references are: *Introductory Econometrics*, 3<sup>rd</sup> edition, by J. M. Wooldridge, Thomson/South-Western, 2006, *Introductory Econometrics with Applications* by Ramu Ramanathan, Dryden-HBJ, 2002, *Undergraduate Econometrics* by R. C. Hill, W. E. Griffiths and G. G. Judge, Wiley, 1997, and *A Guide to Econometrics* by Peter Kennedy, The MIT Press, Cambridge, Massachusetts, 1998.

For statistical computing, the primary program used will be EViews5. All the necessary EViews procedures/commands will be introduced through the tutorial notes and exercises that you will be able to download from the Blackboard, <http://www.blackboard.vuw.ac.nz> prior to each tutorial. For more information on EViews methods, you can look up the help menu in the EIEWS menu bar – user's guide.

You will need to have a printed copy of each tutorial assignment at the commencement of that tutorial, but preferably before then so you know about the expected work ahead of time. This is very important; a few spare copies will be available from tutors at the first tutorial, but none after that. Opening a window in a part of your screen to display the tutorial questions is not good enough as it takes up too much time to read it that way; tutors may not be able to help you in following the questions this way. *Tutorials begin in the second week of lectures*. The notes are necessary for the tutorials since they contain:

- a description of each tutorial's objectives
- theoretical material relevant for each tutorial
- detailed calculation procedures and descriptions of statistical functions

### **Materials and Equipment**

Electronic pocket calculators are permitted at tests or examinations.

### **Assessment Requirements**

Homework Assignments (4)	20%	<i>Assignment due dates are indicated in the detailed course schedule appended to this outline</i>
Mid-trimester Test (1 hour)	30%	<i>In lecture week 7, date &amp; time to be announced</i>
Final Exam (2 hours)	50%	<i>During the Examination Period (6-25 June, 2008)</i>

Any illness or adverse personal circumstances must be notified to the course coordinator – in writing, with medical certificate or relevant evidence – before an assessment. If absence from such assessment is approved, marks for any missed assessment items will be allocated to the Final Exam mark (e.g. if one assignment is missed with approval, then the weighting will be assignments 15%, test 30% and exam 55%).

### **Penalties**

Unapproved late submission of assignments will incur a penalty of 10% per day up to two days. Unauthorised submissions beyond that will not be marked.

### **Mandatory Course Requirements**

There are no mandatory requirements for this course.

### **Communication of Additional Information**

Announcements, and any changes relating to the course, will be made through the Blackboard website, <http://www.blackboard.vuw.ac.nz>. Later in the trimester, copies of the test and final examination questions of the years 2006 and 2007 along with answers will be made available on the Blackboard.

### **Faculty of Commerce and Administration Offices**

#### Railway West Wing (RWW) - FCA Student and Academic Services Office

The Faculty's Student and Academic Services Office is located on the ground and first floors of the Railway West Wing. The ground floor counter is the first point of contact for general enquiries and FCA forms. Student Administration Advisers are available to discuss course status and give further advice about FCA qualifications. To check for opening hours call the Student and Academic Services Office on (04) 463 5376.

#### Easterfield (EA) - FCA/Education/Law Kelburn Office

The Kelburn Campus Office for the Faculties of Commerce and Administration, Education and Law is situated in the Easterfield Building on the ground floor (EA005). This counter is the first point of contact for :

- Duty tutors for student contact and advice.
- Information concerning administrative and academic matters.
- Forms for FCA Student and Academic Services (e.g. application for academic transcripts, requests for degree audit, COP requests).
- Examinations-related information during the examination period.

To check for opening hours call the Student and Academic Services Office on (04) 463 5376.

## Notice of Turnitin Use

Student work provided for assessment in this course may be checked for academic integrity by the electronic search engine <<http://www.turnitin.com>>. Turnitin is an on-line plagiarism prevention tool which identifies material that may have been copied from other sources including the Internet, books, journals, periodicals or the work of other students. Turnitin is used to assist academic staff in detecting misreferencing, misquotation, and the inclusion of unattributed material, which may be forms of cheating or plagiarism. *At the discretion of the School, handwritten work may be copy typed by the School and subject to checking by Turnitin.* You are strongly advised to check with your tutor or the course coordinator if you are uncertain about how to use and cite material from other sources. Turnitin will retain a copy of submitted materials on behalf of the University for detection of future plagiarism, but access to the full text of submissions will not be made available to any other party.

## General University Policies and Statutes

Students should familiarise themselves with the University's policies and statutes, particularly the Assessment Statute, the Personal Courses of Study Statute, the Statute on Student Conduct and any statutes relating to the particular qualifications being studied; see the Victoria University Calendar or go to [www.victoria.ac.nz/home/about/policy/students.aspx](http://www.victoria.ac.nz/home/about/policy/students.aspx)

For information on the following topics, go to the Faculty's website [www.victoria.ac.nz/fca](http://www.victoria.ac.nz/fca) under Important Information for Students:

- Academic Grievances
- Student and Staff Conduct
- Meeting the Needs of Students with Impairments
- Student Support

## Academic Integrity and Plagiarism

Academic integrity is about honesty – put simply it means *no cheating*. All members of the University community are responsible for upholding academic integrity, which means staff and students are expected to behave honestly, fairly and with respect for others at all times.

Plagiarism is a form of cheating which undermines academic integrity. The University defines plagiarism as follows:

*The presentation of the work of another person or other persons as if it were one's own, whether intended or not. This includes published or unpublished work, material on the Internet and the work of other students or staff.*

It is still plagiarism even if you re-structure the material or present it in your own style or words.

*Note: It is however, perfectly acceptable to include the work of others as long as that is acknowledged by appropriate referencing.*

Plagiarism is prohibited at Victoria and is not worth the risk. Any enrolled student found guilty of plagiarism will be subject to disciplinary procedures under the Statute on Student Conduct and may be penalized severely. Consequences of being found guilty of plagiarism can include:

- an oral or written warning
- cancellation of your mark for an assessment or a fail grade for the course
- suspension from the course or the University.

Find out more about plagiarism, and how to avoid it, on the University's website:

[www.victoria.ac.nz/home/studying/plagiarism.html](http://www.victoria.ac.nz/home/studying/plagiarism.html)

## Manaaki Pihipihinga Programme

Manaaki Pihipihinga is an academic mentoring programme for undergraduate Māori and Pacific students in the Faculties of Commerce and Administration, and Humanities and Social Sciences. Sessions are held at the Kelburn and Pipitea Campuses in the Mentoring Rooms, 14 Kelburn Parade (back courtyard), Room 109D, and Room 210, Level 2, Railway West Wing. There is also a Pacific Support Coordinator who assists Pacific students by linking them to the services and support they need while studying at Victoria. Another feature of the programme is a support network for Postgraduate students with links to Postgraduate workshops and activities around Campus.

For further information, or to register with the programme, email [manaaki-pihipihinga-programme@vuw.ac.nz](mailto:manaaki-pihipihinga-programme@vuw.ac.nz) or phone (04) 463 6015. To contact the Pacific Support Coordinator, email [pacific-support-coord@vuw.ac.nz](mailto:pacific-support-coord@vuw.ac.nz) or phone (04) 463 5842.

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The following outline gives the topics we expect to cover, some variations are possible.

Lecture Week	Lecture Topics	Tutorial Topics
1	The nature of econometrics and economic data; some key statistical concepts; causality and regression; Simple regression: interpretation of coefficients.  (Assigned Reading: Textbook chapter 1, chapter 2, p. 34-35)	<i>Tutorials begin from the second week. This week, try out your computer logon username and password (if not done already) to avoid any logon problems next week.</i>
2	Basic assumptions; the ordinary least squares (OLS) method; Properties of OLS estimators – randomness, linearity, unbiasedness and efficiency; consistency of the OLS estimator.  (Assigned Reading: chapter 2, p. 35-53)	<b>Tutorial 1</b> Data handling in EViews, calculate descriptive statistics, draw scatter plots, draw random samples, find critical values and prob values from probability distributions.
3	Probability distribution of OLS estimators; estimating error variance; interval estimation; testing a hypothesis by the interval method, the <i>t</i> -value method, and the <i>p</i> -value method; testing hypotheses with a non-zero null and one-sided alternatives; forecasting and goodness of forecasts; model evaluation using residuals.  (Assigned Reading: chapter 3)	<b>Tutorial 2</b> Simple regression estimation, interpretation of estimates, and test of hypothesis using confidence intervals.  <b>Assignment 1</b> handed out on Wednesday in class.

4	<p>Goodness of fit; effects of changing units of measurement; choice of functional forms of variables, and interpretation of the slope coefficients; comparing the fit of models with the dependent variable in different forms; forecasting with the dependent variable in the log form; OLS regression without an intercept.</p> <p>(Assigned Reading: chapter 4, the corresponding topics)</p>	<p><b>Tutorial 3</b> Tests using critical region and p-value. Measuring and testing goodness of fit.</p> <p><b>Assignment 1 due</b> this week on Thursday by 2.30 pm in your tutor's box.</p>
5	<p>Multiple regression, interpretation of coefficients in multiple regression models; estimation by the OLS method, example with two regressors; the maximum likelihood method; how other things are held fixed in multiple regression; multiple regression with three or more regressors.</p> <p>(Assigned Reading: chapter 5, p.101-114)</p>	<p><b>Tutorial 4</b> Examine regression residuals, construct a model non-linear in variables, forecasting.</p> <p><b>Assignment 2</b> handed out on Wednesday in class.</p>
6	<p>Measures of goodness of fit in a multiple regression; properties of OLS estimators; coefficient variances and covariances; OLS estimation with omission of important variables.</p> <p>(Assigned Reading: chapter 5, p.114-128)</p>	<p><b>Tutorial 5</b> Fit a multiple regression by solving the normal equations, and also by using the relevant EViews command; simulating the assumption of <i>other things remaining the same</i> by multiple regression.</p> <p><b>Assignment 2 due</b> this week on Thursday by 2.30 pm in your tutor's box.</p>
<b>Test</b>	<b>Simple Regression</b>	<b>In lecture week 7, date &amp; time to be announced</b>
7	<p>OLS estimation when unnecessary variables are included; multi-collinearity; probability distributions of OLS estimators and testing single hypotheses; testing a single linear restriction on coefficients.</p> <p>(Assigned Reading: chapter 5, p.128-138, chapter 6, p.141-145)</p>	<p><b>Tutorial 6</b> Model selection by using <math>R^2</math>, <math>\bar{R}^2</math> and <math>MSE</math> measures, Specification error analysis.</p> <p><b>Assignment 3</b> handed out on Wednesday in class.</p>

8	<p>Testing a joint hypothesis by separate <math>t</math>-tests; Testing a joint hypothesis - the WALD <math>F</math>-test, <math>F</math>-test of a single hypothesis, <math>\bar{R}^2</math> in relation to the <math>t</math>-statistic.</p> <p>(Assigned Reading: chapter 6, p.145-153)</p>	<p><b>Tutorial 7</b> Multi-collinearity analysis, testing a single linear restriction on coefficients, testing joint hypotheses by using the WALD and LM tests.</p> <p><b>Assignment 3 due this week</b> on Thursday by 2.30 pm in your tutor's box.</p>
9	<p>Alternative tests in large samples - the WALD chi-square and the Lagrange multiplier tests; variable selection methodologies; dummy variables; dummy variables for seasonal data; intercept and slope dummies; modelling and testing for structural change.</p> <p>(Assigned Reading: chapter 6, p.153-159, chapter 7, p.166-173)</p>	<p><b>Tutorial 8</b> Binary explanatory variables, interpretation regression results using such variables.</p> <p><b>Assignment 4 handed out on</b> Wednesday in class.</p>
10	<p>Violation of assumption on errors: cross-section data and heteroscedasticity, its consequences; how to detect heteroscedasticity; log transformation to alleviate heteroscedasticity; Generalised (or weighted) least squares and measuring goodness of fit.</p> <p>(Assigned Reading: chapter 8)</p>	<p><b>Tutorial 9</b> Heteroscedastic Models.</p> <p><b>Assignment 4 due this week</b> on Thursday by 2.30 pm in your tutor's box.</p>
11	<p>Why is time sequence of data important? Trends and seasonality, serial dependence of errors; OLS estimation and its consequences; testing for serial correlation of residuals; estimation procedures when there is serial correlation.</p> <p>(Assigned Reading: chapter 9, p.203-228)</p>	<p><b>Tutorial 10</b> Serial correlation models.</p>
12	<p>Regressions with lagged variables; models with lagged dependent variables as regressors; estimation of dynamic models.</p> <p>(Assigned Reading: chapter 10)</p>	<p><b>Tutorial 11</b> Dynamic Models.</p>

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