EC2203 Quantitative Methods in Economics II

Teacher Responsible: Christian Salas

Course Intended Primarily for BSc.(Econ) 2nd year.

Core Syllabus: This course completes the quantitative economics sequence begun by the first year EC1102 Quantitative Methods of Economics course. The aim is to provide students with a thorough technical grounding (in mathematical methods, econometrics and computing) for quantitative research in their final-year dissertation.

Course Content:

I. Mathematical Methods (9 main lectures plus 2 supplementary lectures): sets and functions, introduction to equilibrium analysis, vectors, introduction to matrix algebra, matrix inversion and Cramer's rule, quadratic forms, partial differentiation, total differentiation, implicit functions, unconstrained and constrained optimisation of multivariate functions.

II. Econometrics (9 main lectures plus 1 supplementary lecture): essential statistical concepts, introduction to econometric models, identification, introduction to dynamic models, the bivariate regression model, multiple regression analysis, autocorrelation, heteroskedasticity, OLS and simultaneous equations bias, estimation of structural equations.

III. Computing (3 supplementary lectures given in the computing centre): data management and manipulation in STATA, getting to know your data using STATA: methods of descriptive data analysis for time-series and cross-section data, multivariate analysis using STATA. Each student will be provided with a floppy disk containing data files for use in the computing lectures.

An important part of the course is a quantitative project which will account for 10% of the final mark. Each student will be required to analyse a real (and individually-assigned) data set contained in his/her floppy disk, and to present an elegant and properly-structured report of the findings. The analysis and report should convey the student's grasp of all parts of the course by explicitly drawing on elements from parts I, II, and III. Handouts will be distributed giving guidance on how to carry out and write up a quantitative research project.

Pre-Requisites: Knowledge of economic theory and quantitative methods to the level of the first-year courses at Royal Holloway. Note in particular that you are expected to be familiar with the rules of differentiation for a function of one variable. See the hand-written revision sheet at the end of these notes.

Teaching Arrangements: There will be one lecture and one class each week as follows:

AUTUMN TERM 1997

Thursday 9th October	**Lecture 1. Sets and functions (Chiang, Chapter 2)**
Class 1	Written test + Supplementary Lecture 1. Introduction to equilibrium analysis (Chiang, Chapter 3)
Thursday 16th October	**Lecture 2. Vectors (Chiang, Chapter 4) ASSIGNMENT 2**
Class 2	Review of assignment 2
Thursday 23rd October	**Lecture 3. Introduction to matrix algebra (Chiang, Chapter 4) ASSIGNMENT 3**
Class 3	Review of assignment 3
Thursday 30th October	**Lecture 4. Matrix inversion and Cramer's rule (Chiang, Chapter 5) ASSIGNMENT 4**
Class 4	Review of assignment 4
Thursday 6th November	**♣TEST 1♣**
Class 5	Supplementary Lecture 2. Quadratic forms (Chiang, Chapter 11)
Thursday 13th November	**Lecture 5. Partial differentiation (Chiang, Chapter 7) ASSIGNMENT 5**
Class 6	Review of assignment 5
Thursday 20th November	**Lecture 6. Total differentiation (Chiang, Chapter 8) ASSIGNMENT 6**
Class 7	Review of assignment 6
Thursday 27th November	**Lecture 7. Implicit functions (Chiang, Chapter 8)**

	ASSIGNMENT 7
Class 8	Review of assignment 7
Thursday 4th December	**Lecture 8. Unconstrained optimisation (Chiang, Chapters 9 and 11)**
	ASSIGNMENT 8
Class 9	Review of assignment 8
Thursday 11th December	**Lecture 9. Constrained optimisation (Chiang, Chapter 12 and 21)**
	ASSIGNMENT 9
Class 10	Supplementary Lecture 3. Data manipulation and management in STATA (This will be given in the computer centre)
Thursday 18th December	♣**TEST 2**♣
SPRING TERM 1998	
Class 11	Supplementary Lecture 4. Getting to know your data using STATA: methods of descriptive data analysis for time series and cross-section data (This will be given in the computer centre)
Thursday 15th January	**Lecture 10. Essential statistical concepts** **ASSIGNMENT 10**
Class 12	Review of assignment 10
Thursday 22nd January	**Lecture 11. Introduction to econometric models** **ASSIGNMENT 11**
Class 13	Review of assignment 11
Thursday 29th January	**Lecture 12. Identification** **ASSIGNMENT 12**
Class 14	Review of assignment 12
Thursday 5th February	**Lecture 13. Introduction to dynamic models** **ASSIGNMENT 13**
Class 15	Review of assignment 13
Thursday 12th February	♣**TEST 3**♣
Class 16	Supplementary Lecture 5. Multivariate analysis using STATA (This will be given in the computer centre)
Thursday 19th February	**Lecture 14. The bivariate regression model** **ASSIGNMENT 14**
Class 17	Review of assignment 14
Thursday 26th February	**Lecture 15. Multiple regression analysis** **ASSIGNMENT 15**
Class 18	Review of assignment 15
Thursday 5th March	**Lecture 16. Autocorrelation** **ASSIGNMENT 16**
Class 19	Review of assignment 16
Thursday 12th March	**Lecture 17. Heteroskedasticity** **ASSIGNMENT 17**
Class 20	Review of assignment 17
Thursday 19th March	♣**TEST 4**♣
Class 21	Supplementary Lecture 6. OLS and simultaneous equations bias
Thursday 26th March	**Lecture 18. Estimation of structural equations** **ASSIGNMENT 18**

Review lectures will be given in the summer term to prepare you for the final exam. Details will be provided in due course. **Note: your projects for QMII must be handed in by Thursday 26th March 1998.**

Reading List: Students are expected to buy A. Chiang, Fundamental Methods of Mathematical Economics, and P. Kennedy, A Guide to Econometrics. I have asked the campus bookshop to have a sufficient number of copies in stock by the start of term. In addition, very full lecture notes will be provided which in themselves amount to a textbook for the course. These will be distributed on a lecture by lecture basis as the year proceeds, and you should buy a large ring binder in which to keep them neatly and in order.

Examination Arrangements: An unseen written examination during the Examination Term accounts for 50% of the final mark. There will be four in-class tests during the year (see the Timetable above) each of which carries 10% of the final mark. Your project will account for the remaining 10%. Further details will be provided at the appropriate time.