Econ 601: Foundations of Econometrics

COURSE AIMS & OBJECTIVES, KEY SKILLS AND LEARNING OUTCOMES

Course Aims & Objectives: The purpose of this course is to provide students with an introduction to statistics and econometrics, to successfully study a complete course in econometrics. In addition, the course is designed to enable students to analyse the classical linear regression model, its statistical foundations, and its various estimation techniques.

There are no prerequisite modules required before taking this course.

Key Skills: By the end of this course, students should have some knowledge and understanding of:

- Basic statistics and its application to econometrics
- Process of quantitative research enquiry, including formulation of research questions, identification of relevant methodological framework for investigating empirical problems and analysis of the empirical results by verbal, graphical, and econometric means.

Desired Outcomes: By the end of this course, students should be able to:

- Engage in abstract thinking by extracting the essential features of complex systems to facilitate problem solving and decision-making
- Communicate and present complex arguments in oral and written form with clarity and succinctness
- Present, interpret and analyse information in numerical form
- Utilise effectively statistical and other packages
- Apply basic statistical techniques to analyse economic and financial datasets
- Work effectively both individually and within a team environment.

COURSE STRUCTURE

Econ 601 is a 20 credits course and therefore students are expected to input approximately 200 hours of study into the course. The total number of contact hours on Econ 601 is 25 hours. This leaves 175 hours for private study. Course Delivery comes in the form of Lectures with 25 hours delivered over the first 5 weeks of the term (20 hours of lectures and 5 hours of tutorials). There will be optional clinics on the last day of the course.

During your private study you should strike a balance between reading the course material (which is the primary source of information) and the recommended textbooks,

thinking critically about how these fit into the body of knowledge on the subject and about how our level of knowledge can be improved, performing exercises, completing coursework and revising for examinations. You can expect to perform well on this course only if you work consistently through the year.

COURSE CONVENOR

Professor Lorenzo Trapani

LECTURERS CONTACT INFORMATION (Including Office Hours) Email:

lorenzo.l.trapani@gmail.com

Available by appointment (please email to arrange a convenient time)

COURSEWORK ASSESSMENT

The CWA mark will be calculated as 100% coursework. The coursework will be assigned at the end of the course

The coursework will be delivered to students at the end of week 6 of each term and is due for submission at the end of week 10, allowing students 4 weeks for completion.

Coursework must be submitted electronically through the Moodle site for this course.

FEEDBACK ON COURSEWORK:

The coursework will be marked and returned to students within 4 weeks of the submission deadline. Feedback will consist of marker's notes appended to the pdf of your coursework.

MARKING CRITERIA AND PENALTIES

Marking criteria can be found in the Economics Undergraduate Handbook and the general course information paper. An electronic copy of this can be found via the Current Student page of the university website then follow the Academic Regulations link

https://gap.lancs.ac.uk/ASQ/QAE/MARP/Documents/UG-Assess-Regs.pdf

FINAL MARK INFORMATION

This course is assessed 100% by means of coursework. The final mark is the average of the marks obtained in the two pieces of coursework.

COURSE TEXT AND RECOMMENDED READING

Main texts

The main recommended textbook is: R C Hill, W E Griffiths & G C Lim, (2018), Principles of Econometrics, Wiley, 5th Edition.

Students should purchase a copy of this book. For the computer labs you will also need:

W E Griffiths, R C Hill and G C Lim, Using EViews for Principles of Econometrics, Wiley. 5th Edition. This supplementary book presents the EViews software commands required for the examples in Principles of Econometrics, 5th Edition in a clear and concise way. It contains many illustrations that are student friendly. It is useful not only for students and instructors who will be using this software as part of their econometrics course..

The two books are available in the campus bookshop and also on the library online

Students will also find the following texts useful as further reading.

- J.M. Wooldridge (2012) Introductory Econometrics: A Modern Approach, CENGAGE Learning Custom Publishing; 5th edition.
- C Dougherty (2011) Introduction to Econometrics Oxford University Press. ● Pindyck, R. S. and D. L. Rubinfeld, (1997), Econometric Models and Economic Forecasts, 4th edition. McGraw-Hill.
- W.H. Greene, (2011) Econometric Analysis, Pearson Education
- H. Maylor and K. Blackmon, Researching Business and Management (Palgrave Macmillan, 2005) – this may be helpful when planning your computer project
- Maddala, G (1983). Limited Dependent and Qualitative Variables in Econometrics, Cambridge University Press, Cambridge.
- Gujarati, D. (1995). Basic Econometrics, Mc Graw-Hill, New York.
- Kennedy, P (1993). A guide to Econometrics, Basil Blackwell, Oxford.
- Maddala, G. (1992). Introduction to Econometrics, Macmillan, Ontario.
- Stewart, M. and Wallis, K. (1990). Introductory Econometrics, Basil Blackwell, Oxford

<u>Note</u>

Copies of the lecture slides will be made available on the course web pages. You MUST print off the notes for each lecture prior to attending. Solutions to exercises, and some additional material associated with these lectures and course announcements will also be placed on this website.

COURSE OUTLINE/LECTURE SCHEDULE

Day 1: Foundations of statistics

- Descriptive statistics.

- Testing: basic notions, examples.

- Estimation: definition of estimators.

- Properties of estimators: finite and large sample properties.

Day 2: The maximum likelihood estimator and OLS estimation

- The maximum likelihood estimator (MLE): definition and properties.

- The MLE: discussion.

- The simple linear regression model: OLS estimation.

- Assumptions for the linear regression model.

- The properties of OLS.

Day 3: The multiple linear regression model – part 1

- Definition of the multiple linear regression model

- The ceteris paribus interpretation

- Deriving the ordinary least squares (OLS) estimates in a multivariate context

- Goodness-of-fit and information criteria Illustration through worked examples

Day 4: The multiple linear regression model and misspecification analysis – part 1

- Testing Hypotheses about a Single Population Parameter: The t Test
- Testing   Hypotheses about a Single Linear Combination of the Parameters
- Testing Multiple Linear Restrictions: The F Test
- Heteroskedasticity: Evaluating the implication for the OLS estimator of heteroscedasticity, testing, robust standard errors, the GLS estimator

Day 5: The multiple linear regression model and misspecification analysis – part 2

- Serial correlation: Evaluating the implication for the OLS estimator of serial correlation, testing, dynamic models
- Normality: Evaluating the implication for the OLS estimator of lack of normality,testing,removing outliers
- Linearity of the functional form: the RESET test,
- Logarithmic functional forms, models with quadratics and with interactions