

MODULE SPECIFICATION • CORE

Foundations of Econometrics

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.

20	25h	175h	200h
CREDITS	CONTACT HOURS	PRIVATE STUDY	TOTAL STUDY

COURSE CONVENOR

NAME Professor Lorenzo Trapani

OFFICE By appointment — please email to arrange a convenient time

COURSE STRUCTURE

Econ 7901 is a 20–credit course and students are expected to input approximately 200 hours of study. The total number of contact hours is 25 hours, leaving 175 hours for private study. Delivery is by lectures — 25 hours across the first five weeks of term, comprising 20 hours of lectures and 5 hours of tutorials. Optional clinics run on the last day of the course.

During private study, balance the course material (the primary source) against the recommended textbooks: think critically about how these fit into the body of knowledge, perform the exercises, complete coursework and revise. You can expect to perform well only by working consistently through the year.

MODULE PROGRAMME

LECT.	TOPIC	SESSION CONTENT
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, illustrated 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
Day 5	The multiple linear regression model and misspecification analysis — part 2	- Heteroskedasticity: evaluating the implication for the OLS estimator of heteroskedasticity, testing, robust standard errors, the GLS estimator - 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

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

ASSESSMENT

WEIGHTING	100% coursework
ISSUED	End of week 6
DUE	End of week 10 (15 December) — four weeks for completion
SUBMISSION	Electronically via the Moodle site for this course
FEEDBACK	Returned within 4 weeks of the deadline, as marker's notes appended to the PDF of your coursework

Marking criteria and penalties are set out in the Economics Undergraduate Handbook and the general course information paper, available via the Current Student page of the university website under Academic Regulations.

COURSE TEXT & RECOMMENDED READING

Copies of the lecture slides are made available on the course web pages. You must print off the notes for each lecture prior to attending. Solutions to exercises, additional material and course announcements are also placed on this website. Work is screened using plagiarism-detection software.

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