Econometrics I | ECP77001

Year	1
ECTS Credits	10
Contact Hours	20 hours of lectures and 18 hours of computer laboratory sessions
Pre-Requisite	Nil
Semester	1
Module Leader and Lecturer	Professor Carol Newman
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Module Outline:

The aim of this module is to provide students with the skills required to undertake independent applied research using modern econometric methods. The module provides a balance between theoretical and applied econometrics and aims to extend students' understanding of the subject to an advanced level as each part progresses. Students attending this module will deepen their theoretical knowledge of the list of topics below and will develop the necessary practical skills to use these methods in empirical research.

Topics covered include:

1. The Linear Regression Model: Least squares and other estimation methods; properties of estimators; goodness of fit; hypothesis testing; misspecification testing; heteroscedasticity; endogeneity, instrumental variables and the Generalised Method of Moments
2. Econometric Models for Panel Data: Fixed effects and random effects methods
3. Maximum Likelihood Estimation: Principle of Maximum Likelihood Estimation, properties, testing (Wald, Likelihood Ratio and Lagrange Multiplier Tests)
4. Models with Limited Dependent Variables: Binary choice models: the linear probability model, probit and logit models, estimation, interpretation of coefficients, goodness of fit, specification testing, correcting for specification errors; Multi response models: Multinomial logit and ordered probit models; Censored regression.

Module Learning Outcomes:

On completion of the module, students will be able to:

1. derive econometric estimators for linear regression, panel data and limited dependent variable models;
2. show the properties of these estimators and understand the underlying assumptions required;

3. derive appropriate tests for the underlying assumptions and correct for violations of these assumptions;
4. confidently discuss the challenge of identification in empirical research;
5. select the appropriate econometric approach for different data and empirical settings;
6. use STATA to apply these techniques in practice.

Assessment:
Assessment for the module is based on a final exam accounting for 50% of the grade. In addition, students will be required to complete four homework exercises over the course of the semester (accounting for 20% of the overall grade) and to undertake one individual project (accounting for the remaining 30% of the overall grade).

Recommended Reading List:
The core texts for this course are:

- Wooldridge, J. M. (2010), *Econometric Analysis of Cross Section and Panel Data*, latest edition, MIT Press.
- Greene, W. (2008), *Econometrics Analysis*, Pearson.
- Verbeek M. (2017), *A Guide to Modern Econometrics*, 5th Edition. Wiley.

Students may also find the following text books of use:

- Angrist, J. and Pischke, J. (2009), *Mostly Harmless Econometrics*, Princeton University Press.
- Baum, C. F. (2006), *An Introduction to Modern Econometrics using Stata*. Stata Press.
- Davidson, R. D. and MacKinnon J. G. (2004), *Econometric Theory and Methods*, Oxford University Press.
- Pevalin, D. and Robson, K. (2009), *The Stata Survival Manual*. McGraw Hill.

The course will primarily follow the notation in Wooldridge and Greene with students advised to consult Verbeek and Davidson and MacKinnon for an alternative treatment of the issues. Angrist and Pischke provide an excellent practical introduction to using econometrics and is a must read for students. In addition, supplementary reading will be provided from time to time as the course progresses. Baum and Pevalin and Robson are important source for the applied component of the course.