

Foundations of Econometric Theory (QM5)

Syllabus

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Academic year 2015-2016

Unit code:	ECON21356
Level:	2
Credit point value:	20
Unit director:	Etienne Lalé
Lecturer:	Etienne Lalé
Prerequisites:	Quantitative Methods 1 (ECON11122); Quantitative Methods 2 (ECON12122)
Co-requisite:	QM3 Econometrics (ECON20020)
Teaching:	9 two-hours lectures, Thursday 3:00pm - 5:00pm 9 one-hour tutorials, Friday 10:00am - 11:00am, 11:00am - 12:00am, 2:00pm - 3:00pm
Assessment:	Three-hour closed book examination at the end of the Spring term
Office location:	Social Sciences complex, room 2B11
Office hours:	Wednesday 4:30pm - 5:30pm

1 Description of the Course

The course is taught in two parts. The first part covers Statistical theory essential for Econometric theory. It focuses on key properties of sample statistics and on hypothesis testing. It also provides students with new notions to add to their mathematical toolkit, such as moment-generating functions. The second part is solely concerned with detailed examination of least squares (ordinary, restricted and generalized). It also deals with maximum-likelihood estimation of the general linear model.

2 Classes and Course-work

There is one two-hour lecture and one one-hour tutorial session per week. Students are given the opportunity to apply the knowledge acquired during the lectures through problem sets that will be discussed and dealt with during the tutorial sessions. The course material will be distributed through Blackboard.

The **course assessment** consists of a three-hour closed book examination at the end of the Spring term. The examination paper will be in three sections: Section A with two questions in Statistics, Section B with one question in Statistics and one in Econometrics, Section C with three questions in Econometrics. All questions carry equal weight; Students will be required to answer one question from Section A, one question from Section B and two questions from Section C.

3 Course Outline

Statistics

1. Refresher: random variables
2. Moment-generating functions
3. Sampling: key concepts
4. Properties of sample statistics
5. Point estimation
6. Hypothesis testing

Econometrics

1. Least squares: geometry and algebra
2. Performance of OLS
3. Partitioned regression
4. Heteroskedasticity
5. Maximum-likelihood
6. Restrictions and hypothesis testing

4 Relevant Books

The following textbooks cover the essential topics of the course. Students will be referred to parts of these books as we proceed through the lectures:

- Freund, J.E. *Mathematical Statistics*. Pearson Prentice Hall, 6th Edition, 1999. (available in the Arts and Social Sciences Library, ref. QA276 FRE)
- Hogg, R.V., J. McKean and A.T. Craig. *Introduction to Mathematical Statistics*. Pearson Prentice Hall, 6th Edition, 2005. (available in Queen's building Library, ref. QA276 HOG)
- Greene, W.H. *Econometric Analysis*. Pearson Education, 7th Edition, 2012. (available in the Arts and Social Sciences Library, ref. HB139 GRE)
- Stock, J.H. and M.W. Watson. *Introduction to Econometrics*. Pearson Education, 3rd Edition, 2012. (available in the Arts and Social Sciences Library, ref. HB139 STO)

The following textbooks go beyond the course content, but they may also be of interest for students:

- Casella, G. and R. Berger. *Statistical Inference*. Duxbury Press, 2nd Edition, 2002. (available in Queen's building library, ref. QA276 CAS)
- Ruud, P.A. *An Introduction to Classical Econometric Theory*. Oxford University Press, 1st Edition, 2000. (available in the Arts and Social Sciences Library, ref. HB139 RUU)