Queen Mary College, University of London, BSc. (Econ)
Course: **ECN 321 ECONOMETRIC THEORY**
Lecturer: **D.S.G.Pollock** (room W310, email d.s.g.pollock@qmw.ac.uk)

COURSE PROSPECTUS

1. Aims of the unit

This course aims to give students an understanding of the mathematical and statistical foundations of modern econometric analysis. It also aims to give them some experience of using an up-to-date econometric software package.

The concepts of algebraic geometry will be used to present the central ideas of regression analysis in a way which exposes their underlying logic and makes them memorable. Using some simple concepts of polynomial algebra, an operator notation will be developed which enables regression analysis to be extended to encompass the essential techniques for modelling dynamic econometric relationships.

2. Learning Outcomes

On completion of the course, the students should be able to envisage the techniques of econometrics as a organised system as opposed to a mere collection of recipes. As a result, they should be better equipped to assimilate unfamiliar econometric techniques which they might encounter subsequently. They should reach an understanding of the how the theory of hypothesis testing is used to develop and to refine models of economic relationships. They should also understand the dynamic implications of an econometric regression model which contains distributed lags and lagged dependent variables.

3. Topics to be Studied

1. Matrices and Vectors
2. Elements of Linear Algebra and Vector Space Analysis,
3. The Classical Linear Regression Model: Least-Squares Estimation,
4. The Classical Linear Regression Model: Tests of Hypotheses,
5. Systems of Linear Regression Equations,
6. Serially Correlated Regression Disturbances,
7. Lagged Dependent Variables, Distributed Lags and Autoregressive Residuals,

8. Dynamic Responses, the Impulse Response the Step Response and the Median Lag,

9. Nonstationary Time Series and Cointegrated Econometric Variables.

4. Arrangements for Teaching and Assessment

The course is taught in the fifth semester. The lectures are given each week in two consecutive hours (Mondays from 2–4pm) and the students must attend a one-hour class each week which takes place in a computer laboratory. The students are expected to take accurate notes during the lectures and to access the adjunct material which is to be found on the associated web page and in the text books mentioned below.

The classes will serve several purposes. They will provide the opportunity for further discussion of the ideas expounded in the lectures. They will provide an opportunity for demonstrating the solutions to the problem sets which will be distributed in the lectures. They will provide an opportunity for learning an econometric software package and for using it to investigate some econometric data.

In semester 6, the students will receive a collection of printed notes which should serve to guide their revision and to prepare them for the examination. The students will be assessed in a two-hour examination in June. Examples of examination papers from previous years are available on the Web site.

5. Readings

The principal texts for the course are POLLOCK, *Lectures in Introductory Econometrics* and POLLOCK, *A Course of Econometrics,* both of which are available on the Web at the address ⟨qmc.ac.uk.\economics\staff\~ugte133⟩

There are many published texts of econometric theory. The best-selling text, and therefore one of the cheapest, is *Econometric Methods: Fourth Edition* by J. JOHNSTON and J. DiNARD0, McGraw–Hill (1997). A recent text with a considerable coverage is W. GREENE, *Econometric Analysis: Third Edtion,* Macmillan (1997). Another book which is both accessible and brief is *Econometrics* by JON STEWART, Philip Allan (1991). An older and well-established book is JAN KMENTA, *Elements of Econometrics: second edition.* A book which provides a good background in statistics and matrix algebra as well treating some basic econometric topics is *Introduction to Statistics and Econometrics,* by T. AMEMIYA, Harvard University Press (1994). Finally, an introductory book to which it might be useful to refer in the first instance is *Introduction to Econometrics: Second edition* by G.S. MADDALA, Macmillan, (1992).