

School of Social Sciences, Economics

ECON60901 Pre-Session Maths and Stats Course 2011/2012

(COURSE COMMENCES ON TUESDAY 20 SEPTEMBER 2011)

1. Course details

- Pre-requisite(s): The following website has a section entitled “The Minimum Requirement in Mathematics”, which explains the level of mathematics assumed at the start of ECON 60901;
- <http://www.socialsciences.manchester.ac.uk/disciplines/economics/postgraduate/psmaths>
- You are advised to make every effort to prepare for the course in the weeks before coming to Manchester, by making sure you have at least the minimum mathematics requirement described on this web-site.
- Course Co-ordinators/
Lecturers: Prof Paul Madden (room 3.064, Arthur Lewis) 0161 275 4870, paul.madden@manchester.ac.uk
Dr Eduardo Re-Rodriguez (room 1.308, University Place) 0161 276 7903
- Lecture times and rooms: The course is intensive, running between 9am to 5pm (with some breaks or gaps each day) on each of the following days, in the buildings and lecture theatres indicated in brackets;
- Tuesday 20 September** (in Chemistry G54)
Wednesday 21 September (in Chemistry G53)
Monday 26 September (9-11 in Simon 2.61; 11-1 in Simon G.31; 3-5 in Zochonis G.07)
Tuesday 27 September (9-1 in Simon 4.63; 2-4 Samuel Alexander East Wing, LG12)
Wednesday 28 September (10-12 in Chemistry G53; 2-4 in Coupland 3, Theatre A)
Thursday 29 September (9-11 in Zochonis G.07; 12-2 in Simon B.41)
Friday 30 September (10-12 in Chemistry G53; 1-3 in Roscoe Theatre B)
- Each day will involve lectures, tutorials and opportunities for students to attempt solutions to problems themselves. The first 3.5 days are on Maths (Paul Madden), the rest on Stats (Eduardo Fe-Rodriguez).
- For travel/campus information, please see <http://www.manchester.ac.uk/visitors/travel/>
- Informal Assessment: On-line examinations will be available.

2. Aims and objectives

Aims

The aim of this course is to develop your understanding of key mathematical and statistical techniques that are important to modern postgraduate economics and related subjects.

Objectives

At the end of this course students should be able to demonstrate their understanding of basic concepts of sets and functions, calculus techniques for optimisation, including the Lagrangian, systems of linear equation, linear algebra, and integration. Students should also be able to use simple statistical concepts such as random variables, probability distributions, populations, parameters, sampling and hypothesis testing.

3. Syllabus and reading list

Recommended Textbooks

Mathematics A course booklet will be distributed on the first morning. The following are also useful;

Fundamental Methods of Mathematical Economics, Alpha C. Chiang (McGraw-Hill).

Essential Mathematics for Economic Analysis, Knut Sydsaeter and Peter Hammond (Prentice Hall)

Statistics

Introductory Econometrics: A Modern Approach, Jeff Wooldridge (Thomson) [This book is the recommended text for ECON 60611 Introduction to Econometrics]

A. Sets, Number, and Functions

- Sets. (Chiang, pp. 11-17.), (Sydsaeter & Hammond, pp.74-79)
- Necessary and Sufficient Conditions. (Chiang, pp. 88-90.), (Sydsaeter & Hammond, pp.66-71)
- Numbers. (Chiang, pp.10-11, 351.), (Sydsaeter & Hammond, pp.1-4)
- Functions. (Chiang, pp. 20-31, 268-273, 282-287.), (Sydsaeter & Hammond, pp.83-134)

B. Univariate Calculus and Optimization

- Continuity. (Chiang, pp. 132-140, 147-148.), (Sydsaeter & Hammond, pp.242-247)
- Derivatives and Differentials. (Chiang, pp. 149-153, 239-244, 188-191, 292-294.), (Sydsaeter & Hammond, pp.163-214)
- Unconstrained Optimization. (Chiang, pp. 231-239, 245-253.), (Sydsaeter & Hammond, pp.269-303)
- Constrained Optimization

C. Linear Algebra

- Systems of Two Equations in Two Unknowns. (Chiang, pp. 36-38.), (Sydsaeter & Hammond, pp. 377-394)
- Matrix Algebra. (Chiang, pp. 55-63, 76-87, 92-94.), (Sydsaeter & Hammond, pp.463-477)

- Quadratic Forms. (Chiang, pp. 318-323.)

D. Multivariate Calculus and Optimization

- Partial Derivatives. (Chiang, pp. 174-177, 194-195, 204-209.), (Sydsaeter & Hammond, pp.377-394)
- Unconstrained Optimization. (Chiang, pp. 307-318, 337-348.), (Sydsaeter & Hammond, pp.463-477)
- Constrained Optimization. (Chiang), (Sydsaeter & Hammond, pp. 501-518)
- Functions with Economic Applications. (Chiang, pp. 410-417, 421-423.)

E. Integration

- The Indefinite Integral. (Chiang, pp. 436-446.), (Sydsaeter & Hammond, pp. 305-311)
- The Definite Integral. (Chiang, pp. 447-454.), (Sydsaeter & Hammond, pp. 312-318)

F. Introduction to Statistics (Wooldridge, Appendices B and C)

Random variables and probability distributions; properties of probability distributions; the normal and related distributions; populations parameters and sampling; estimation; hypothesis testing.

Plagiarism

Plagiarism is the theft or expropriation of someone else's work without proper acknowledgement, presenting the material as if it were one's own. Plagiarism is a serious academic offence and the consequences are severe. Guidelines on plagiarism can be found on

<http://www.campus.manchester.ac.uk/staffnet/policies/plagiarismguidencetostudents/>