

EC2040 - MATHEMATICS AND STATISTICAL METHODS

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ECTS VALUE: 10

RATIONALE AND AIMS

The first half of the module provides a broad, practically oriented introduction to inferential statistics of the kind used across the range of social science disciplines. It builds on the material on descriptive statistics and probability covered in the Introduction to Statistics module students will have taken in the JF year.

The second half of the module will develop the calculus (differentiation and integration) from the JF Maths module, with increased depth of coverage and further applications. The aim of the module is to consolidate and develop skills developed in JF Mathematics so as to provide a solid basis for any calculus you might meet in the Sophister years.

CONTENTS

Statistics

- Construction of confidence intervals for estimators
- Hypothesis testing
- Analysis of variance
- Simple linear regression.

Mathematics

- Analysis of convexity and concavity
- Optimisation of multivariate functions
- Constrained optimisation
- Integration
- Applications in consumer theory, producer theory, labor supply and macroeconomics

MODULE LEARNING OUTCOMES

Having successfully completed this module, you will be able to:

- Explain and apply mathematical and statistical terminology
- Solve problems related to statistical inference, mathematical optimization and applications.
- Formulate economic problems in the language and abstractions of mathematics and statistics

SKILLS DEVELOPED IN THIS MODULE

Satisfactory completion of this module will contribute to the development of the following key skills:

- Abstraction from concrete problems to generic concepts
- Problem-solving using quantitative methods
- Ability to perform simple statistical analysis

EVALUATION AND ASSESSMENT

Term	Assignment/test/exam	Due Date	% Total Module Marks
Michaelmas term	Take home exam	December 16, 2011	10%
Michaelmas term	7 Problem sets	Weekly	10%
Hilary Term	TBC	TBC	20%
Trinity Term	Written exam	TBC	60%

ASSESSMENT AND LEARNING OUTCOMES

The learning outcomes are assessed during a written exam where students have to formulate and solve problems from business and economics using the mathematical and statistical techniques studied during the module. In addition, there will be assessed problem sets and an assignment to give students practice dealing with real data. Marking will depend on (1) correctness of the formulation of the problems, (2) correctness of the method used for solving the problems, (3) correctness of the application of the method used for solving the problems, and (4) the format, logical consistency, and linguistic accuracy of the reported solution.

RECOMMENDED READING

Statistics:

Moore , D.S., G.P. McCabe, and B.A. Craig (2011), Introduction to the Practice of Statistics, 7th Edition, W.H. Freeman.

Mathematics:

Alpha C. Chiang and Kevin Wainwright (2005), Fundamental Methods of Mathematical Economics, McGraw-Hill, 4th Edition.