Universitat de les Illes Balears

Teaching guide

Academic year	2016-17
Subject	10153 - Mathematics and Statistics for Economics
Group	Group 1, 1S
Teaching guide	A
Language	English

Subject identification

Subject	10153 - Mathematics and Statistics for Economics
Credits	0.8 de presencials (20 hours) 1.2 de no presencials (30 hours) 2 de totals (50 hours).
Group	Group 1, 1S (Campus Extens)
Teaching period	First semester
Teaching language	English

Professors

Lecturers	**Horari d'atenció als alumnes**					
	Starting time	**Finishing time**	**Day**	**Start date**	**Finish date**	**Office**
Magdalena Concepción Cladera Munar mcladera@uib.es	11:00	12:00	Thursday	12/09/2016	20/01/2017	DB247
Miguel Quetglas Oliver miquel.quetglas@uib.es	17:00	18:00	Tuesday	03/10/2016	12/02/2017	DB214 - Cita prèvia per e-mail
	16:00	17:00	Tuesday	13/02/2017	30/06/2017	DB214 - Cita prèvia

Contextualisation

The contents of this course are introductory, instrumental and theoretical in nature. They are aimed to give to the student the basics of the mathematical and statistical tools that are used in economic analysis. The instruments that are going to be presented in this course are going to be used later on in other subjects of the master.
The course consists in two parts: Mathematics and Statistics. The first one provides an elementary review of the practical applications of mathematical tools required in economic theory. Covered topics include differential and integral calculus in one variable, optimization of functions of several variables and an introduction to matrix algebra. Since the instrumental orientation of this subject, the concepts will be applied on the rest of Module A and B of the Master. As for Statistics, the contents include some basic concepts in statistical inference and regression analysis. These contents are necessary to follow the classes of the subjects Tourism Demand and Econometrics, for instance.

Requirements

Essential requirements

The starting level of the Mathematics part is equivalent of a first year university course. As it is aimed at reviewing some of the basics concepts, the students should have background about:
o Elementary algebra (equations and inequalities, system of equations, rational and radical expressions)

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o Trigonometry (trigonometric and inverse functions, identities)
o Analytic geometry (Cartesian coordinate system, parametric equations, solid geometry)
o Calculus (functions, limits, derivatives, integrals, differentiation and integration of transcendental functions)

Relating the part of Statistics, to follow adequately this course and the econometrics classes of the master, the student needs some knowledge about random variables and probability distributions. The student needs to be familiar with topics like:
o Discrete and continuous random variables.
o Probability function, probability density function and cumulative distribution function.
o Expected value and variance of a random variable.
o The normal distribution and related distributions (t, chi-square, F).

Skills

Specific

* To learn how to plan economic theory models using tools that interpret the reality (21).
* To apply appropriate scientific methodologies knowing its basis (26).

Generic

* To convert an empirical problem in a research object and to formulate conclusions (8).
* To apply the knowledge into new contexts (9).
* To have an innovative, prospective and proactive vision (17).
* To make decisions, to solve problems and to develop new ideas (18).
* To critically interpret and evaluate results (19).

Content

Theme content

1. MATHEMATICS

1. Functions of Real Variable
   - Elementary functions
   - Derivatives
   - Integrals

2. Functions of several variables
   - Definition. Domain and graph. Level curves
   - Partial derivatives and gradient. Higher-order partial derivatives.
   - Optimization. Lagrange Multipliers

3. Matrices and determinants
   - Definition
   - Matrices operations
   - Determinants

2. STATISTICS

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1. Statiscal Inference
   - Definitions and basic concepts. What's statistical inference? Population and sample; point and interval estimation; hypothesis testing.
   - Parameter estimation. Parameter, estimate and estimator; sampling distributions and properties of estimators; confidence intervals.
   - Hypothesis testing. Definitions and decision making process; types of errors and power of a test.
2. The classical linear regression model
   - Specification.
   - Estimation.
   - Goodness of fit and hypothesis testing.
   - Departures from the classical linear regression model

Teaching methodology

In-class work activities

Modality	Name	Typ. Grp.	Description	Hours
Assessment		Large group (G)	Written exam	4
Other	Self study	Large group (G)	Self study	16

At the beginning of the semester a schedule of the subject will be made available to students through the UIBdigital platform. The schedule shall at least include the dates when the continuing assessment tests will be conducted and the hand-in dates for the assignments. In addition, the lecturer shall inform students as to whether the subject work plan will be carried out through the schedule or through another way included in the Campus Extens platform.

Distance education work activities

Modality	Name	Description	Hours
Individual self-study	Exercices	Different problem sets will be given to the student to practice the theoretical contents.	10
Individual self-study	Study of the theoretical contents	The student will study the theoretical contents of the subject using the bibliographic references.	20

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Specific risks and protective measures

The learning activities of this course do not entail specific health or safety risks for the students and therefore no special protective measures are needed.

Student learning assessment

Assessment

Modality	Assessment
Technique	Extended-response, discursive examinations **(retrievable)**
Description	Written exam

Assessment criteria

Final grade percentage: 100% with minimum grade 5

Resources, bibliography and additional documentation

Basic bibliography

Alpha C. Chiang, "Fundamental methods of mathematical economics", McGraw-Hill.

Maddala, G. S. (2001). "Introduction to Econometrics". Wiley

Complementary bibliography

Greene, W. (1998). "Econometric Analysis". Prentice Hall

Hill, R. C.; Griffiths, W. and Judge, G. (2001). "Undergraduate Econometrics". Wiley

Kennedy, P. (2003). "A Guide to Econometrics". The MIT Press, 5th edition

Newbold, P. (2007). "Statistics for business and economics". Prentice-Hall International

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