Quantitative Research Methods in Applied Research in Economics and Business 2015/2016

Code: 42620
ECTS Credits: 15

Degree	Type	Year	Semester
4313384 Applied Research in Economics and Business	OB	0	1

Contact

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Use of languages

Principal working language: english (eng)

Teachers

Yarine Fawaz

Maria del Carmen Alarcon del Amo

Angel Luis Lopez Rodriguez

Prerequisites

There are not prerequisits.

Objectives and Contextualisation

To provide the students with the technical and quantitative tools necessary to carry out applied research in economics and business.

Skills

- Possess and understand knowledge that provides a basis or opportunity for originality in the development and/or application of ideas, often in a research context
- Produce and draft projects, technical reports and academic articles in English, making use of the appropriate terminology, argumentation, communication skills and analytical tools for each context, and rigorously evaluate those produced by third parties.
- Select and apply different and adequate models and/or theoretical frameworks, methodologies and techniques for scientific research, data sources and IT tools for research applied to business and economics.
- Student should possess an ability to learn that enables them to continue studying in a manner which is largely self-supervised or independent
- Understand, analyse and evaluate the complexity, functions and main challenges of the current socio-economic and business reality using analytical tools and/or precise methodologies.
- Work in international and inter-disciplinary teams.

Learning outcomes

1. Apply the main quantitative techniques of multivariate analysis for the testing of scientific hypotheses.
2. Identify the main scientific methodologies of a quantitative nature that are usable in the field of research applied to business and economics.

3. Possess and understand knowledge that provides a basis or opportunity for originality in the development and/or application of ideas, often in a research context
4. Produce and draft projects, technical reports and academic articles in English, making use of the appropriate terminology, argumentation, communication skills and analytical tools for each context, and rigorously evaluate those produced by third parties.
5. Student should possess an ability to learn that enables them to continue studying in a manner which is largely self-supervised or independent
6. Understand the mathematical, statistical and econometric fundaments and instruments required for statistical inference.
7. Utilize existing IT tools and packages (STATA, SPSS, etc.) for the quantitative analysis of statistical, business and bibliographic databases.
8. Work in international and inter-disciplinary teams.

Content

This module has 4 topics. The contents of these topics are the following:

Mathematics

1- Matrices.

2- Functions and distribution functions.

3- Derivatives and Taylor series.

4- Optimization.

5- Integrals

6- Differential Equations

Applied Statistics

1- Analysis of one variable

2- Sampling and sampling distribution

3- Estimate using intervals

4- Test of hypotheses

5- Analysis of the relation between two variables: Contingency tables

Econometrics

1-Linear regression model

2-Ordinary Least Squares (OLS) estimation

3-Inference in OLS regression

4-Asymptotic theory

Multivariate analysis

1- Introduction and classification of multivariate analysis techniques

2- ANOVA and MANOVA

3- Principal Components Factor analysis

4- Correspondence factor analysis

5- Discriminant Analysis

6- Cluster Analysis

7- Structural Equation Models

Methodology

Classes, essays and tutorials. Study and research activity.

Activities

Title	Hours	ECTS	Learning outcomes
Type: Directed			
Classes	93.75	3.75	1, 2, 3, 4, 5, 6, 7, 8
Type: Supervised			
Essays and tutorials	56.25	2.25	1, 2, 3, 4, 5, 6, 7, 8
Type: Autonomous			
Study and research activities	212	8.48	1, 2, 3, 4, 5, 6, 7, 8

Evaluation

Class attendance, presentation and discussion of essays and problems, exams.

If any student doesn't reach 5 as the qualification of the module, the student must re-evaluate all the topics of the module that hasn't passed. The final mark of the module will be calculated with the new assessments, but in any case will exceed 5. The format of the re-evaluation process will be chosen by the subject teacher, and should take place during the second two weeks in May.

Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Class attendance	5%	0	0	1, 2, 3, 4, 5, 6, 7, 8
Exams	60%	8	0.32	1, 2, 3, 4, 5, 6, 7, 8
Presentation and discussion of essays and problems	35%	5	0.2	1, 2, 3, 4, 5, 6, 7, 8

Bibliography

- Davison, R. and J. MacKinnon, (2004), Econometric Theory and Methods.Oxford Univ.Press.
- Green, W. (2008), Econometric Analysis. Prentice Hall.Sixth edition.
- Hair, J.F.; Black, W.C.; Babin, B.J. and R.E. Anderson(2010), Multivariate Data Analysis. Prentice Hall (7th edition).

- Hayashi, F. (2000), Econometrics.Princeton University Press.
- Hubbard,J H. (1999).Vector Calculus, Linear Algebra and Differential forms (a unified approach),Prentice Hall
- Newbold, P.(2009) "Statistics for Business and Economics". Prentice-Hall, 7th Edition.
- Sydsaeter, K., Hammond,P. and A. Strom (2012).Essential Mathematics for Economic Analysis, Pearson.
- Verbeek, M. (2001), A guide to modern econometrics.Wiley.2nd edition.