

Quantitative Methods

Code: 41984
ECTS Credits: 10

| Degree | Type | Year | Semester |
|---|------|------|----------|
| 4311312 Management, Organization and Business Economics | OB | 0 | 1 |

Contact

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Use of languages

Principal working language: english (eng)

Prerequisites

No specific preconditions although some general knowledge in statistics are more than welcome.

Objectives and Contextualisation

The module introduces multivariate methods for the quantitative analysis of large databases. It also includes methods for creating and improving measurement scales and for analysis of experimental and non-experimental data. The data used will be related to economic and business issues, with an special emphasis on introducing gender aspects in the analyses. The use of statistical packages is emphasized through exercises and applied works. The module also contains econometric methods including response models, discreet censored regression models, methods of sample selection and panel data models. Additionally, also addresses mathematical programming in the context of operational research.

Skills

- Analyse and summarise large amounts of complex quantitative and qualitative information using statistical, econometric and mathematical programming techniques.
- Develop a critical and a constructive attitude to one's work and that of others.
- Develop an ethical, social and environmental commitment.
- Explain and motivate the analyses, interpret the results and present all these clearly and concisely in English.
- Identify the relevant sources of information and their content for subsequent analysis.
- Leadership and decision-taking capability.
- Make use of quantitative documentary sources that are significant for the economic analysis of organisations from a critical perspective.
- Master the technical and IT tools needed to carry out applied studies.
- Present research results to various audiences using the different media available.
- Recognise the problems associated with the comparability of different organisational situations in empirical international research
- Understand qualitative models of the firm and interpret their results.
- Understand the application of theoretical models to real business problems.
- Work in multidisciplinary international teams.

Learning outcomes

1. Choose the most appropriate theoretical model for the objectives set by the business situation under study.
2. Develop a critical and a constructive attitude to one's work and that of others.
3. Develop an ethical, social and environmental commitment.
4. Explain and motivate the analyses, interpret the results and present all these clearly and concisely in English.
5. Further investigate the differences between different organisational situations.
6. Identify the aspects that differentiate the theoretical models.
7. Identify the relevant sources of information and their content for subsequent analysis.
8. Identify the sources of data at international level.
9. Know and distinguish the characteristics of the different business databases.
10. Know different statistical, econometric and mathematical programming techniques.
11. Leadership and decision-taking capability.
12. Master the technical and IT tools needed to carry out applied studies.
13. Present research results to various audiences using the different media available.
14. Resolve the models of probability and statistics, econometrics and mathematical programming.
15. Select the most appropriate techniques to analyse both quantitative and qualitative information.
16. Show mastery of the analysis of experimental data and survey data.
17. Work in multidisciplinary international teams.

Content

The module provides vital input into decision-making in business and management. In particular, the course provides an applied introduction to data analysis. The main purpose is to provide students with the basic knowledge for developing empirical analysis and understanding the results. The approach to the subject will be essentially practical, being STATA the statistical computer package used throughout the module.

The following topics will be covered:

1. Data management, graphics and applications.
2. Descriptive statistics. Significance. Plots. Hypotheses tests.
3. Normality tests. Parametric and non-parametric tests for comparison of means.
4. Analysis of cross-classifications.
5. Measures of association.
6. Correlation.
7. Regression.
8. Logistic regression.
9. Factor analysis. Cluster analysis and property fitting.
10. Structural Equation Models.
11. Discrete choice models.
12. Censored and truncated models.
13. Panel Data.

Further details are provided in the MMOBE web page.

Methodology

The module presents a practical approach, therefore sessions are scheduled in computer rooms and developed through the use of statistical packages (STATA mainly).

Generally, professors present different techniques (objectives and requirements related to the type of variables), they use the statistical packages and teach how they can be used in relation to the techniques previously commented, and finally they develop some exercises.

Other exercises and cases are assigned to the students.

Activities

| Title | Hours | ECTS | Learning outcomes |
|---|-------|------|---|
| Type: Directed | | | |
| Lectures, discussions and case presentations | 100 | 4 | 1, 5, 6, 8, 9, 10, 14, 15, 16 |
| Type: Supervised | | | |
| Training and monitoring of work in progress and cases | 15 | 0.6 | 1, 5, 6, 8, 9, 10, 14, 15, 16 |
| Type: Autonomous | | | |
| Reading related cases and practical preparation, study and preparation of schemes | 95 | 3.8 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 |

Evaluation

The system followed in the module considers 3 elements to assess the performance of the students:

1. Class participation.
2. Assignments.
3. Test.

Evaluation activities

| Title | Weighting | Hours | ECTS | Learning outcomes |
|---------------------|-----------|-------|------|---|
| Assignments | 40% | 30 | 1.2 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 |
| Class participation | 5% | 0 | 0 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 |
| Test | 55% | 10 | 0.4 | 1, 3, 4, 5, 6, 8, 9, 10, 12, 14, 15, 16 |

Bibliography

Afifi, A., May, S., and Clark, V.A. (2011) *Practical Multivariate Analysis*, 5th ed., Chapman & Hall/CRC.

Amemiya, T. (1981) *Qualitative Response Models: A Survey*, *Journal of Economic Literature*, 19: 483-536.

Cameron, A.C., and Trivedi, P.K (2009) *Microeconomics using Stata*, STATA Press.

Greene, W. (2003) *Econometric Analysis*. Fifth edition. Upper Saddle River. New Jersey, USA: Prentice - Hall.

Hair, J., Black, B., Babin, B., Anderson, R., Tatham, R. (2005) *Multivariate data analysis*. Sixth edition. Upper Saddle River. New Jersey, USA: Prentice - Hall.

Maddala, G. (1983) *Limited Dependent and Qualitative Variables in Econometrics*. Econometric Society Monographs No 3, Cambridge University Press, Cambridge, chapters 2 and 3.