**Code: 1438** **Quantitative Methods in Socio-Economics**
**Degree:** 2nd cycle – Agriculture
**Stream:** Agricultural and Environmental Economics and Rural Development
**Curricular Year: 1st** **Semester Course: 2nd**
**Credits: 6 ECTS** **Compulsory**
**Language:** Portuguese/English
**Responsible:** Ana Maria Contente de Vinhas Novais
**Other lecturer(s):** -
**Web Site:** http://www.isa.utl.pt/home/node/3807

1. **Contact hours:**
**Lectures** 28 **Lecture/Praticals** 42 **Others** 14 **Total** 84

2. **Objectives:**

It's intended that the students acquire a strong understanding of a set of methods of multivariate analysis and decision making support allowing a) an appropriate application for the resolution of problems on economics and social science contexts; b) a critical capacity for the reading and interpretation of the results from those methodologies or similar ones.

3. **Programme:**

I - Introduction
1. Measurement problems in the social and economic sciences
2. Measurement scales
3. Sources of information and data sets

II - Multivariate analysis
Factor analysis: general principles
1.2 Correspondence analysis
1.3 Applications of Correspondence Analysis
1.4 Results interpretation.

2. Cluster Analysis
2.1 Classification concepts
2.2 Similarity measure
2.3 Hierarchical agglomerative and iterative partitioning methods

III – Mathematical Programming
1. Linear Programming Model for economic analysis in agriculture
1.1. Review of linear programming model: mathematical formulation and graphical solution; the simplex method
1.2 Duality
1.3 Assumptions and modelling techniques
1.4 Sensitivity Analysis;

2. Multiple criteria programming
2.1 Technological versus economic problems
2.2 Attributes, goals, objectives and criteria
2.3 Optimal solutions (Pareto Optimality)
2.4 Linear multiobjective programming, compromise programming and goal programming

**4. Bibliography:**

**Main Bibliography**

I.
Aldenderfer, M. S.; Blashfield, R. (1984). *Cluster Analysis*, London, Sage Publications, 1º ed.
Greenacre, M. J. (1984). *Theory and Applications of Correspondence Analysis,* London, Academic Press, INC.
Hair, Joseph F. et al. (2003). Multivariate Data Analysis. New York, Macmillian Publishing Company.
II.
Hazell, P. B. R.; Norton, Roger D. (1986). *Mathematical Programming for Economic Analysis in Agriculture*, London, Macmillan Publishing Company.
Romero, C. (1993). *Teoría de la decisión multicriterio: Conceptos, técnicas y aplicaciones*, Madrid, Alianza Editorial.

**Other Bibliography**

I
Pereira, H. Garcia e Sousa, A. J. (2002). Análise de dados para o tratamento de quadros multidimensionais.http://biomonitor.ist.utl.pt/~ajsousa/AnalDadosTratQuad|Mult.html.
II
Jorge, R. F. . *A Aplicação da Programação Linear ao Planeamento da Empresa Agrícola*. Lisboa, Instituto Superior de Agronomia (texto de apoio)

**5. Assessment:**

1. Continuous assessment is based on:
a) Resolution of practical exercises in the class room
b) Elaboration of exercises started in the class and completed at home, one for each item of the programme
c) Two tests, one about I and II parts and another about the III part of the programme.

2. A student that doesn't reach a positive average mark has access to final examination, if he (she) has completed one of the proposed exercises.

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| **6.** Estimated Workload: | 168 | Hours |
| **7.** Last Update: | 19/7/2010 | |