

Academic Year: 2017/2018		
Course: Multivariate Analysis of the Geographic Information		
Coordinator: Alina Esteves		
Teaching Staff: Alina Esteves, Miguel Padeiro, Nuno Marques da Costa		
ECTS: 6	Weekly Hours: 4h	Typology: Theoretical and practical classes
Contents		
<p>1.– Basic and framework Concepts</p> <p>1.1.- Concepts</p> <p>1.1.1.– Scientific research in general</p> <p>1.1.2.– Scientific research in Geography: Inductive and deductive methods. The scope of analysis: extensive approach</p> <p>1.1.3.– The nature of geographic information: Data matrices, The Cattell data cube.</p> <p>2.- Introduction to Matrix Algebra</p> <p>3.– Introduction to Multivariate Data Analysis</p> <p>4. – Factor Analysis</p> <p>4.1.- Introduction: Objectives and Use</p> <p>4.2.- Types of Factor Analysis</p> <p>4.2.1.- Principal Components Analysis</p> <p>4.2.2.- Factorial Analysis</p> <p>4.3.- Analytical procedures</p> <p>5. - Multiple Linear Regression</p> <p>5.1. - Concepts of Simple Linear Regression: a revision</p> <p>5.2. - The Multiple Linear Regression Model</p> <p>5.2.1. – Multiple correlation and determination coefficients</p> <p>5.2.2. - Regression coefficients (b's and betas)</p> <p>5.2.3. - Types of multiple regression: simultaneous and step by step.</p> <p>6. - Numerical Classification</p> <p>6.1. - Presentation of the problem</p> <p>6.2. - Measures of similarity and distance</p> <p>6.3. – Grouping strategies</p>		
Objectives and skills		
<p>Objectives:</p> <ul style="list-style-type: none"> - Learn to use some of the most common techniques of multivariate data analysis, in different geographical contexts; - Know in which conditions multivariate analysis of data can be used; - Understand the basic theoretical aspects and the practical procedures of multivariate analysis of data; - Have the ability to perform multivariate data analysis; - Know how to interpret the results, critically assessing the application of those analytical methods, as tools to understand the realities and the geographical processes. <p>Skills:</p> <ul style="list-style-type: none"> - Critically evaluate the applicability of multivariate techniques to concrete situations in Geography; - Properly apply the techniques of multivariate analysis, interpreting the results critically. 		

References

- ABREU, D. (2006) – *Análise de Dados II - Programa*, CEG, EPRU nº 69, Lisboa. (cota CEG: JB - 90/A GE)
- EBDON, D. (2006) - *Statistics in Geography*. Basil Blackwell, Oxford. (cota CEG: JB - 89 GE)
- KLINE, P. (2005) - *An easy guide for factor analysis*. Routledge, London. (cota CEG: JB - 92 GE)
- MILES, J.; SHEVLIN, M. (2007) - *Applying regression & correlation: a guide for students and researchers*. Sage, London. (cota CEG: JB - 91 GE)
- REIS, E. (2001) - *Estatística Multivariada Aplicada*, 2ª ed.. Ed. Silabo, Lisboa. (cota CEG: JB - 77 GE)
- ROBINSON, G. M. (1998) – *Methods & Techniques in Human Geography*. John Wiley & Sons, Chichester, UK. (cota na FLUL: 911.3 ROB,G)

Knowledge evaluation methods and their partial grades

General regime of evaluation:

The final grade of each student is the result of the evaluation of the following elements according to the proportions specified below:

- a practical research essay (with a maximum number of 3 students), which includes a first individual component done in the classroom PC and a second component done by the group of students applying the multivariate techniques to real-world data. The component done collectively must be handed in paper to the teachers (15% + 20% of the final grade);
- two written tests, the first in mid-term and the second at the end of the semester (25% + 35% of the final grade);
- teachers' opinion of each student (5% of the final grade)

If the final grade is over 9,5 and the weighted average of the written tests is below 8,5 the student must do a new written test. The final mark is the result of the average of this test with the grade of regular evaluation.

Special regime of evaluation:

The final grade of each student is the result of the evaluation of the following elements according to the proportions specified below:

- a practical individual research essay which includes a first individual component done in the classroom PC and a second individual written component applying the multivariate techniques to real-world data, handed in paper to the teacher (15% + 25% of the final grade);
- two written tests, the first in mid-term and the second at the end of the semester (25% + 35% of the final grade);

If the final grade is over 9,5 and the weighted average of the written tests is below 8,5 the student must do a new written test. The final mark is the result of the average of this test with the grade of regular evaluation.