

**Quantitative Methods and Statistics**

Code: 104244  
ECTS Credits: 6

Degree	Type	Year	Semester
2503710 Geography, Environmental Management and Spatial Planning	OB	2	1

**Contact**

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**Use of Languages**

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: Yes  
Some groups entirely in Spanish: Yes

**Teachers**

Francesc Muñoz Pradas

**Prerequisites**

There are no prerequisites

**Objectives and Contextualisation**

Quantitative Methods and Statistics is taught the Second Course of the Degree in Geography, Environment and Planning.

The objective is to introduce students to the use of statistical methods for the design and analysis of data related to Geography. The orientation is eminently practical applying the statistical procedures through the software MS Excel.

The specific objectives are:

1. To introduce students to the basic concepts of descriptive and inferential statistics
2. To decide what the appropriate statistical method is based on the data and the research objectives.
3. To apply basic and multivariate statistics tests
4. To argue the results obtained from the graphic representation, exploration and analysis of the information to describe and characterize territories.

**Competences**

- Apply methods and techniques of quantitative, qualitative and field work analysis in the interpretation of territorial and environmental processes.
- Combine distinct techniques and methods of representation and spatial analysis in elaborating materials for transmitting results.

- Explain and represent territorial processes using statistical techniques, and graphic, cartographic and geographical information representations.
- Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
- Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.

## **Learning Outcomes**

1. Combine distinct techniques and methods of representation and spatial analysis in elaborating materials for transmitting results.
2. Interpret the statistical result of data analysis.
3. Make basic and instrumental use of statistical programs to introduce and identify survey data and for the transformation and analysis of those data.
4. Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
5. Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
6. Understand the main sources of information and scientific documentation related to regional and environmental processes.
7. Use basic and multivariate statistical methods appropriately.

## **Content**

### Block 1. Data sources and variables in Geography

#### 1.1 Data sources in Geography: typologies and characteristics

#### 1.2 Data and types of variables

### Block 2. Univariate statistics

#### 2.1 Statistics of central tendency and dispersion

#### 2.1 Transformations of variables

### Block 3 Bivariate statistics

#### 3.1 Relationship between variables: correlation and linear regression

#### 3.2 Relationship between variables: analysis of contingency tables.

### Block 4. Quantitative methods

#### 4.1 Indices of location and inequality

#### 4.2 Time series

### Block 5. Introduction to statistical inference

#### 5.1 Basic concepts in inference

#### 5.2 Confidence intervals

#### 5.3 Contrast hypothesis

#### 5.4 Inference for regression

## 5.5 Inference for contingency tables.

### Methodology

The course is structured from directed, supervised and autonomous activities where the student will learn to develop the contents of the subject with the teacher's face-to-face support at different levels.

- Guided activities: theoretical classes and face-to-face practices. If they are not feasible, teaching will be implemented through Teams platform
- Supervised activities: face-to-face monitoring of practices. If they are not feasible, teaching will be implemented through Teams platform
- Autonomous activities: study of the theoretical contents and complementary readings and completion of the practices.

The professor will spend approximately 15 minutes of a class to allow students to respond to teacher activity assessment and subject assessment surveys

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

### Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Master classes and carrying out of directed practices in the computer lab	45	1.8	7, 1, 6, 2, 4, 3
Type: Supervised			
Completion of practices in the computer lab	22	0.88	7, 1, 6, 2, 4, 3
Tutorials	3	0.12	7, 1, 6, 2, 4, 3
Type: Autonomous			
Completion of the course practices	60	2.4	7, 1, 6, 2, 4, 3
Personal study, preparation tests	15	0.6	7, 1, 6, 2, 4, 3

### Assessment

Assessed activities:

- A written exam in two parts. Weighting factor: 50 percent of the final grade. Each part would represent 25 percent of the final grade.
- Assignment (2) Weighting factor: 40 percent of the final grade. Each assignment would represent 10 percent of the final grade
- Problem set resolution at computer room. Students would delivery half of all problems solved. Weighting factor: 10 percent of the final mark.

Assesment criteria:

- Final grade will be the weighted average of all activities submitted to assesment.

- The final grade of the written exam will be the average of the two parts.
- Students who have only completed 1/3 of the assessed activities will be classified as "Not evaluable".
- The activities not delivered or performed on the indicated date will be classified as "Not Submitted".

-In the event of a student committing any irregularity that may lead to a significant variation in the grade awarded to an assessment activity, the student will be given a zero for this activity, regardless of any disciplinary process that may take place. In the event of several irregularities in assessment activities of the same subject, the student will be given a zero as the final grade for this subject.

Students interested in reviewing grades from assessed activities would send a message to the professor through the Moodle room. Students will be informed of the date for reviewing grades after assessing learning activities. In this message students will justify their request.

Resit examination:

The resit examination will be done through a written test. Students who have completed 2/3 of the assessed activities and have achieved a final grade between 3 and 5 points would be allowed to attend the resit examination. The grade from this examination will replace all previous grades. The final grade can not be higher than 5.

Gender issues: Data analysis in assignments and problem set resolution will be taking into account social and gender differences.

In the event that tests or exams cannot be taken onsite, they will be adapted to an online format made available through the UAB's virtual tools (original weighting will be maintained). Homework, activities and class participation will be carried out through forums, wikis and/or discussion on Teams, etc. Lecturers will ensure that students are able to access these virtual tools, or will offer them feasible alternatives.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Assignment	40 percent	2	0.08	7, 1, 6, 2, 4, 3
Problems set at computer room	10 percent	0.5	0.02	1, 2, 5, 4
Written exam	50 percent	2.5	0.1	7, 1, 6, 2, 4, 3

## Bibliography

BARDINA, Xavier; FARRÉ, Mercè; LÓPEZ ROLDAN, Pedro. (2005). *Estadística: un curs introductori per a estudiants de ciències socials i humanes. Volum 2 descriptiva exploratòria bivariant. Introducció a la inferència*. Bellaterra: Servei de Publicacions Universitat Autònoma de Barcelona, Col·lecció Materials 166.(\*).

BURT, James E; BERBER, Gerald. (1996). *Elementary Statistics for Geographers*. Guilford press. London. (Capítols: 3, 5, 7,8, 9).

CALBERG, Conrad. (2011). *Análisis Estadístico con Excel*. Editorial Anaya. Madrid

EBDON, David. (1982). *Estadística para geógrafos*. Barcelona: Oikos Tau. pp 18-23, 28-33, 51-68, 129-142, 168-175, 182-212, 240-249.

FARRÉ, Mercè. (2005). *Estadística: un curs introductori per a estudiants de ciències socials i humanes. Volum 1 descriptiva i exploratòria univariant*. Bellaterra: Servei de Publicacions Universitat Autònoma de Barcelona, Col·lecció Materials 162.(\*).

FREEDMAN, David; PISANI, Robert; PURVES, Roger; ADHIKARI, Ani. (1993). *Estadística*. Segunda edición. Antoni Bosch editor. Barcelona. (Partes: II, III, VI ( cap. 23, pp. 459-480) y VIII. (cap. 26, pp. 519-550)).(\*)

HAMMOND, Robert; McCullagh, Patrick. (1980). *Técnicas cuantitativas en Geografía* Editorial Saltes Madrid. (Capítulos 3, 6 (pp. 173-196) 7 (pp. 239-256) y 8).

López-Roldán, Pedro.; Fachelli, Sandra. (2015). *Metodología de la Investigación Social Cuantitativa*. Bellaterra (Cerdanyola del Vallès): Dipòsit Digital de Documents, Universitat Autònoma de Barcelona. 1ª edición. Edición digital: <http://ddd.uab.cat/record/129382>. (Parte II, Cap. 1; Parte III cap 3; Parte III cap 6, pp. 1-23; Parte III cap 4).(\*)

MARQUÉS, Felicidad. (2009). *Estadística descriptiva a través de EXCEL*. México D.F.: Alfaomega grupo editor S.A..

MARSH, Catherine (1990). *Exploring Data. An Introduction to Data Analysis for Social Scientists*. Polity Press. Oxford. Cap 1 y 2 y Parte II.

PEÑA SANCHEZ DE RIVERA, David; ROMO URROZ, Juan José. (1997). *Introducción a la estadística para las ciencias sociales*. McGraw-Hill Interamericana de España. Madrid

RASO, José Maria; MARTÍN VIDE, J.I.; CLAVERO, Pedro. (1987). *Estadística básica para Ciencias Sociales*. Barcelona. Ariel. Capítulos: 4 (pp. 77-92) y 6.

ROGERSON, Peter A. (2014). *Statistical Methods for Geography*. Sage. London. (Cap 2.5.7 y 8).

(\*) Main references

Gender issues have been taken into account in the list of references.

## Software

Desirable software SPSS (not available with licence in the UAB).

Software employed in the course will be EXCEL (specific Menu: Analysis of data. Menu to install through the option of Complements in the spreadsheet).

Software optional (if not available in EXCEL) R Studio