

## 28313 - Geography: data and information processing

### Syllabus Information

**Academic Year:** 2019/20

**Subject:** 28313 - Geography: data and information processing

**Faculty / School:** 103 - Facultad de Filosofía y Letras

**Degree:** 419 - Degree in Geography and Land Management

**ECTS:** 9.0

**Year:** 2

**Semester:** Annual

**Subject Type:** Compulsory

**Module:** ---

### 1.General information

#### 1.1.Aims of the course

#### 1.2.Context and importance of this course in the degree

#### 1.3.Recommendations to take this course

### 2.Learning goals

#### 2.1.Competences

#### 2.2.Learning goals

#### 2.3.Importance of learning goals

### 3.Assessment (1st and 2nd call)

#### 3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

### 4.Methodology, learning tasks, syllabus and resources

#### 4.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, practical exercises, individual and group tasks, guided tasks, field work, autonomous work and study.

Students are expected to participate actively in the class throughout the semester.

Classroom materials will be available via Moodle. These include a repository of the lecture notes used in class, the course syllabus, as well as other course-specific learning materials.

#### 4.2.Learning tasks

The course includes the following learning tasks:

- Lectures. Presentation of the conceptual and methodological aspects of the syllabus.
- Individual or group activities using spreadsheets (Excel), statistical software (Past; SPSS; R) and Geographical Information Systems (ArcGIS).

#### 4.3.Syllabus

The course will address the following topics:

Section 0.

- Topic 1. Nature of the geographical information: spatial units, thematic, temporal and topological components.
- Topic 2. Sources of the information: problems and types.
- Topic 3. Quality of the information.

#### Section 1.

- Topic 4. Introduction and initial considerations in the treatment of the information.
- Topic 5. Descriptive statistics: measurements of centrality, dispersion and shape.
- Topic 6. Distributions: types of variables, distributions for continuous and discrete variables.

#### Section 2.

- Topic 7. Probability: concept and calculation.
- Topic 8. Confidence intervals and hypothesis testing.
- Topic 9. Independence and association of quantitative variables: correlation and simple linear regression.
- Topic 10. Multiple linear regression analysis.

#### Section 3.

- Topic 11. Comparison between variables from two or more populations: one-factor ANOVA (analysis of variance).
- Topic 12. Factorial ANOVA.

Seminar: Geographical Information Systems and spatial statistics.

### 4.4.Course planning and calendar

The course contents are divided into three main sections (and an initial, introductory section; Topics 1-3). The first two sections (Topics 4-10) run along the first semester and, the third one (Topics 11-12), in the first half of the second semester. After the completion of each one of these three main sections, the students will make a written test and a practical exercise (in groups of three or four people) which will be presented in public.

After all the sections are taught, the Seminar 'Geographical information systems and spatial statistics' will be run in the second half of the second semester. After its completion, the students will have to present, individually, a Learning Portfolio.

### 4.5.Bibliography and recommended resources

Basic bibliography:

- O'SULLIVAN, D. y UNWIN, D. (2010): *Geographic Information Analysis*, Hoboken, John Wiley, 405 pp.
- PEÑA, D. (2008): *Fundamentos de estadística*, Alianza Editorial, Madrid, 688 pp.

Recommended bibliography:

- ALLEN, D.W. (2010): *GIS Tutorial II: Spatial Analysis Workbook*, Redlands, ESRI Press, 340 pp.
- CAMARERO, L. (coord.) (2010): *Estadística para la investigación social*, Garceta Grupo Editorial, Madrid, 308 pp.
- DAVIS, J.C. (2002): *Statistics and data analysis in Geology*, Wiley & Sons, New York, 638 pp.
- MITCHELL, A. (1999): *The Esri Guide to GIS Analysis: Volume 1: Geographic Patterns & Relationships*, ESRI Press, London, 186 pp.
- MITCHELL, A. (2005): *The Esri Guide to GIS Analysis: Volume 2: Spatial Measurements & Statistics*, ESRI Press, London, 238 pp.
- PARDO, A. y RUIZ, M.A. (2002): *SPSS 11. Guía para el análisis de datos*, McGraw-Hill, Madrid, 715 pp.
- PÉREZ, C. (2009): *Técnicas estadísticas multivariantes con SPSS*, Garceta Grupo Editorial, Madrid, 378 pp.
- RASO, J.M., MARTÍN VIDE, J. y CLAVERO, P. (1987): *Estadística básica para Ciencias Sociales*, Ariel Geografía, Barcelona, 271 pp.
- SÁNCHEZ CARRIÓN, J.J. (2008): *Manual de análisis estadístico de los datos*, Alianza Editorial, Madrid, 649 pp.
- SANTOS, J.M. y GARCÍA, F.J. (2008): *Análisis estadístico de la Información Geográfica*, UNED, Madrid, 395 pp.
- SHAW, G. y WHEELER, D. (1985): *Statistical techniques in Geographical Analysis*, Wiley & Sons, New York, 364 pp.
- WONG, D.W.S. y LEE, J. (2005): *Statistical Analysis of Geographic Information*, Hoboken, John Wiley, 446 pp.