

Methods and Techniques for Spatial Analysis

Code: 104238
ECTS Credits: 6

2024/2025

Degree	Type	Year
2503710 Geography, Environmental Management and Spatial Planning	FB	1

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Teaching groups languages

You can view this information at the [end](#) of this document.

Prerequisites

There is no prerequisites in this course.

Objectives and Contextualisation

Methods and Techniques for Space Analysis are taught the First Year of the Degree in Geography, Environment and Territorial Planning.

This subject offers a basic introduction to the representation of data in Geography, to describe and analyze the territorial phenomena. The subject follows an approach based on the resolution of specific tasks of description or analysis, ordered according to types of data, purpose and field of application. For each specific task, the appropriate methods of data analysis (graphical, statistical or cartographic) are presented systematically, together with the necessary basic concepts and application cases.

The objectives of the subject are:

- Capacity to solve basic tasks of analysis and presentation of data (visualization and graphical description, statistics and cartography) to describe and characterize territories or natural and social phenomena that take place in the territory.
- Provide the necessary conceptual, methodological and technical background for subjects or regional subjects, as well as for the most advanced instrumental subjects in the treatment and analysis of geographical information.

The subject covers the conceptual, methodological and technical aspects to solve practical works of geographical analysis:

- Concepts about the nature of analysis and geographic information.
- Methodological approach, documentation, operational design, implementation and presentation of results of a project.
- Compilation of data, their recording and manipulation by spreadsheets, and their organization through databases.
- Resolution of the needs of the exploration of the information, and of description and classification of the territories or phenomena studied, through techniques of graphic representation, description and statistical classification and cartographic representation.

- Introduction to new techniques: automatic mapping, geographic information systems, remote sensing, geolocation.
- Access to sources, data and other resources related to geoinformation.
- Treatment and representation of data as an instrument to describe and analyze socio-spatial phenomena.
- Application of data processing in scientific research.

Concepts of visual communication are for the elaboration of graphic or cartographic documents effective for visualization, analysis and presentation of data.

Learning Outcomes

1. CM07 (Competence) Interpret relevant data that include a reflection on social, scientific or ethical issues from cartographic data and spatial analysis.
2. CM08 (Competence) Communicate the results of a study using different techniques and methods of representation and spatial analysis.
3. CM09 (Competence) Plan the work in an autonomous and effective way in order to achieve the objectives set by means of the choice of variables and the use of the appropriate methodologies of graphic representation.
4. KM11 (Knowledge) List the main cartographic tools in relation to spatial analysis.
5. SM10 (Skill) Use methods and techniques of spatial analysis in geography (automatic cartography, geographic information systems and geolocation).
6. SM11 (Skill) Structure the collection of information for a specific study through the use of databases and other resources related to geoinformation.
7. SM12 (Skill) Describe a territory or natural phenomenon by means of data representation (visualisation and graphic, statistical and cartographic description).

Content

Block 1. DATA ANALYSIS IN GEOGRAPHY

1. Methods of geographical analysis
2. Geographical information
3. Geographic data sources

Block 2. VISUALIZATION AND DESCRIPTION OF GEOGRAPHICAL DATA

4. Methods and statistical graphs of thematic description
5. Graphical methods and statistics for exploring thematic relations
6. Diagrams with their own name
7. Graphical and statistical methods of thematic classification

Block 3. COMMUNICATION AND PRESENTATION OF RESULTS

9. Graphic design elements
10. Format and means of presentation of results

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Master classes	47	1.88	CM07, KM11, SM11, SM12, CM07
Type: Supervised			
Course exercises and course work	22	0.88	CM08, CM08
Course work tutorial	3	0.12	CM07, CM09, SM10, CM07
Type: Autonomous			
Course exercises and course work	40	1.6	CM07, CM08, SM10, CM07
Independent student work	35	1.4	CM08, CM09, CM08

The subject consists of 3 blocks of different content, nature and intensity, which have different development dynamics.

Block 2 - Representation methods

Block 2 is the main core and the subject's thickness (approximately 75%). It is a totally practical block and each topic is developed through a set of units divided into a variable number of tokens, one for each specific method, grouped into thematic groups or sections of the unit.

Each card includes the definition of the necessary concepts, the exposition of the method (origin, purpose, application, description, variants, utility and bibliographical references) illustrated with examples, a case or detailed example of the step-by-step procedure, and Exercises, both learning and consolidation.

The chips are short to be able to be worked independently, but they can presuppose previous chips and therefore usually require the sequential development of the group of chips in each section and each unit. In all the units, the sequence of work will be indicated by the teacher.

Blocks 1 and 3 - Cross-sectional knowledge

In addition to the methodological units (Block 2), there are units of a transversal nature. Block 1, dedicated to putting data analysis methods in the context of analysis and geographic information (approx. 15%), and Block 3, designed to provide graphic design resources (10% approx.) . The units of these two transversal blocks are not developed sequentially or by whole units, but are introduced when required by the development of Block 2.

The development of units of the transversal block 1, general concepts, and 3, of graphic design resources, is also made from notes of reduced extension, organized in charts.

NOTA

15 minutes of a class will be reserved, within the timetable established by the center/title, for the complementation by the students of the evaluation surveys of the teacher's performance and the evaluation of the course.

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.

Assessment

Continuous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Classe attendance	5%	0	0	CM07, SM10, SM12
Course exercises	15%	0	0	CM08, CM09, KM11
Course work	20%	0	0	CM07, CM08, CM09, KM11, SM10, SM11, SM12
Exam	40%	3	0.12	CM07, CM08, SM12
Questionnaire	20%	0	0	CM07, SM10, SM12

A) EVALUATION ACTIVITIES

1 - Course exercises to follow the continuous evaluation of the contents.

Assessment of the course exercises: The formal aspects, the relevance of the answer that demonstrates the achievement of the degree of knowledge about the subject, the resolution, representation and interpretation of the results, as well as the real realization of the correct calculation of the calculations.

2 - Course work is where the knowledge acquired during the semester is applied and its public presentation is made.

Assessment of the course work: the formal aspects, the approach of the objective and the variables of analysis, use of the methodologies of graphic representation and analysis, development and resolution of the problems raised and public defense of the work.

The hours of the exercises and of the work of course are included in the supervised activities and of autonomous work.

3 - Practical exam (3 partials) to consolidate applied knowledge on the Methods and Techniques of spatial analysis in Geography. 3 practical exams will be held. The final grade of the exam will be the average of the 3 partials, but the average will only be made if they have been passed individually. Otherwise they will have to recover the suspended.

4- Questionnaire (2 types of text) to consolidate theoretical knowledge about the Methods and Techniques of spatial analysis in Geography. 2 theoretical quizzes will be carried out. The final grade of the exam will be the average of the 2 partials, but the average will only be made if they have been passed individually. Otherwise they will have to recover the suspended.

B) OTHER TOPICS TO TAKE INTO ACCOUNT

In order to be able to average with the exercises and the course work it is **MANDATORY** that the 4 partial ones are approved with a 5. In case the examination is not passed it will not be averaged with the other marks.

Continuous assessment makes it mandatory to submit all learning activities in order to pass the course.

Exercises submitted after the deadline will have a maximum score of 5.

In order to take the exam, it is **MANDATORY** to have submitted all the exercises. Delivery may **NOT** be made after the exam date. In case of not making the deliveries the student will not be able to appear in the examination.

C) NON-ASSESED

Students will obtain a Not assessed/Not submitted course grade unless they have submitted more than 1/3 of the assessment items.

D) REVISIONS

On carrying out each evaluation activity, lecturers will inform students (on Moodle) of the procedures to be followed for reviewing all grades awarded, and the date on which such a review will take place.

E) RE-EVALUATION

Those evaluation activities that have been suspended will not be recovered, it is not possible to appear if they have not been previously evaluated.

The maximum grade for the recovered activities will be a 7.

On carrying out each evaluation activity, lecturers will inform students (on Moodle) of the procedures to be followed for reviewing all grades awarded, and the date on which such a review will take place.

F) PLAGIARISM

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.

G) SINGLE ASSESSMENT

This subject does not incorporate single assessment.

Bibliography

References in spanish (statistics and cartography)

Cortizo Álvarez, Tomás (1998) *Los gráficos en geografía*. Gijón: Tria-ka.

Ebdon, David (1982) *Estadística para geógrafos*. Vilassar de Mar: Oikos-Tau.

Estebáñez, José y Bradshaw, Roy P. (1978) *Técnicas de cuantificación en geografía*. Madrid: Tebar Flores.

Gutiérrez Puebla, Javier; Rodríguez, Rodríguez Vicente y Santos Preciado, José Miguel (1995) *Técnicas cuantitativas: Estadística básica* Vilassar de Mar: Oikos-Tau.

Raso, José María; Martín Vide, Javier y Clavero Pedro (1987) *Estadística básica para ciencias sociales*. Barcelona: Ariel.

References in english (statistics and cartography)

Matthews, Huguette i Foster, Ian (1989) *Geographical Data: Sources, Presentation and Analysis* Oxford: Oxford University Press. 140 p.

Mitchell, Andy (1999) *The ESRI Guide to GIS Analysis. Volume 1: Geographic Patterns and Relationships* Redlands (California, USA): Environmental Systems Research Institute, Inc. 186 p.

Monmonier, Mark (1993) *Mapping It Out: Expository Cartography for the Humanities and Social Sciences*. Chicago (Illinois, USA): The University of Chicago Press. 301 p.

Walford, Nigel (1994) *Geographical Data Analysis*. Chichester (UK): John Wiley & Sons, Ltd. 446 p.

Software

Software:

EXCEL

Triplot

Language list

Name	Group	Language	Semester	Turn
(PLAB) Practical laboratories	11	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	12	Catalan	second semester	morning-mixed
(TE) Theory	1	Catalan	second semester	morning-mixed
(TE) Theory	2	Catalan	second semester	morning-mixed