UAB
Universitat Autònoma de Barcelona

Methods and Techniques for Spatial Analysis

Code: 104238
ECTS Credits: 6

2025/2026

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

Contact

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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) Structure the collection of information for a specific study through the use of databases and other resources related to geoinformation.
6. SM11 (Skill) Describe a territory or natural phenomenon by means of data representation (visualisation and graphic, statistical and cartographic description).
7. SM11 (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			
Field trip (PCAM)	8	0.32	CM08, SM11, CM08
Master classes	39	1.56	CM07, CM08, SM10, SM11, CM07
Type: Supervised			
Course exercices and course work	21	0.84	CM07, CM08, KM11, SM10, SM11, CM07
Course work tutorial	3	0.12	CM07, CM08, KM11, SM10, SM11, CM07
Type: Autonomous			
Course exercices and course work	39	1.56	CM07, CM08, CM09, KM11, SM10, SM11, CM07
Independent student work	34	1.36	CM07, CM08, CM09, KM11, SM10, SM11, CM07

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.

Non-sexist language will be taken into account and gender-sensitive methodologies and examples will be used.

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.

La overnight field trip will be coordinated with the subject *Introduction of Physical Geography*.

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

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Classe attendance	5%	0	0	CM07, CM08, CM09, SM11
Course exercices	15%	0	0	CM09, KM11, SM10, SM11
Course work	20%	0	0	CM07, CM09, KM11, SM10
Exam	40%	4.5	0.18	CM07, CM08, SM11
Theoretical test	20%	1.5	0.06	KM11, SM10, SM11

A) ASSESSMENT ACTIVITIES

1 - Course Exercises to monitor the continuous assessment of the course content.

Assessment of course exercises: Formal aspects, the relevance of the response demonstrating the level of knowledge attained, the problem-solving approach, representation and interpretation of results, as well as the accuracy of the calculations.

2 - Course Project, in which students apply the knowledge acquired during the semester and the public presentation will be in the overnight flied trip. The topics of the course trip are commons to the *Introduction to Physical Geography*.

Assessment of course project: Formal aspects, formulation of objectives and analytical variables, use of graphic representation and analytical methodologies, development and resolution of the proposed problem, and public defense of the project.

The time allocated to course exercises and the project is included in both supervised and autonomous learning activities.

3 - Practical Exams (3 partial exams) aimed at consolidating applied knowledge on Methods and Techniques of Spatial Analysis in Geography. There will be three practical exams. The final exam grade will be the average of the three partials, provided each has been passed individually. Otherwise, the failed exam(s) must be retaken.

4 - Theoretical Exams (2 exams) aimed at consolidating theoretical knowledge on *Methods and Techniques of Spatial Analysis in Geography*. There will be two theoretical exams. The final exam grade will be the average of the two partials, provided each has been passed individually. Otherwise, the failed exam(s) must be retaken.

B) OTHER CONSIDERATIONS

In order to calculate the average with the course exercises and the course project, it is MANDATORY tohave passed both the practical and theoretical exams. If the exam has not been passed, the average with the other assessment components will not be calculated.

Continuous assessment requires theMANDATORY submission of all learning activities in order to pass the course.

Exercises submitted after the deadline will receive a maximum grade of 5.

To be eligible to sit for the exam, it is MANDATORY to have submitted all exercises. Late submissions after the exam date will not be accepted. Students who fail to submit the required work will not be allowed to take the exam.

C) NOT ASSESSED

Students who fail to submit at least 1/3 of the assessed activities will receive a Not Assessed grade.

D) REVIEW PROCEDURE

At the time each assessment activity takes place, students will be informed via the Moodle platform about the procedure and date for reviewing grades.

E) RE-EVALUATION

Students may retake failed practical and theoretical exams, provided they were previously attempted. It is not possible to retake an exam that was not previously assessed.

Assessment activities (course project, exercises, practical and theoretical exams) cannot be retaken if they were failed due to plagiarism, copying, or fraudulent use of AI.

The maximum grade for a resit exam is 7 out of 10.

F) PLAGIARISM

If a student commits any irregularity that may significantly affect the grade of an assessment activity, that activity will be graded with a zero, regardless of any disciplinary actions that may be initiated. If multiple irregularities occur in assessment activities for the same course, the final grade for the course will be zero.

G) SINGLE ASSESSMENT

This course does not offer a single (final-only) assessment system.

H) AI

This subject allows the use of AI technologies exclusively for support tasks such as [***bibliographic or content-based searches, text correction or translations, where applicable]. In the case of subjects in a Modern Languages degree, use of translation must be specifically authorised by the teacher. Other specific situations may be contemplated, as deemed appropriate by the teacher.

The student must clearly (i) identify which parts have been generated using AI technology; (ii) specify the tools used; and (iii) include a critical reflection on how these have influenced the process and final outcome of the activity.

Lack of transparency regarding the use of AI in the assessed activity will be considered academic dishonesty; the corresponding grade may be lowered, or the work may even be awarded a zero. In cases of greater infringement, more serious action may be taken

Bibliography

References in spanish (statistics and cartography)

Cortizo Àlvarez, Tomás (1998) *Los gràficos en geografia*. Gijón: Tria-ka.

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

Estebánez, 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 cuantita-tivas: Estadística básica* Vilassar de Mar: Oikos-Tau.

Raso, José María; Martín Vide, Javier y Clavero Pedro (1987) *Estadística bàsica para ciencias sociales.* Barcelo-na: Ariel.

References in english (statistics and cartography)

Matthews, Huge i Foster, Ian (1989) *Geographical Data: Sources, Presen-tation and Analysis* Oxford: Oxford University Press. 140 p.

Mitchell, Andy (1999) *The ESRI Guide to GIS Analysis. Volume 1: Geographic Patterns and Relation-ships* 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

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this link. To consult the language you will need to enter the CODE of the subject.

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