

Methods and Techniques for Spatial Analysis

Code: 104238
ECTS Credits: 6

| Degree | Type | Year | Semester |
|--|------|------|----------|
| 2503710 Geography, Environmental Management and Spatial Planning | FB | 1 | 2 |

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

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: No

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.

Competences

- Combine distinct techniques and methods of representation and spatial analysis in elaborating materials for transmitting results.
- Demonstrate skills of self-analysis and self-criticism
- Draw up action and intervention plans in the territory which respond to sociodemographic and environmental problems.
- 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.
- Systematically analyse and interpret environmental, demographic, urban and landscape elements.

Learning Outcomes

1. Combine distinct techniques and methods of representation and spatial analysis in elaborating materials for transmitting results.
2. Demonstrate geographical problems in cartographic information.
3. Demonstrate skills of self-analysis and self-criticism.
4. Differentiate the basic stages in scientific research into social sciences.
5. 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.
6. Summarise geographical information in basic cartographic products.

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

Methodology

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.

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 | 47 | 1.88 | 1, 4, 2, 5, 6 |
| Type: Supervised | | | |
| Course exercises and course work | 22 | 0.88 | 1, 3, 4, 2, 5, 6 |
| Course work tutorial | 3 | 0.12 | 1, 3, 4, 2, 5, 6 |
| Type: Autonomous | | | |
| Course exercises and course work | 30 | 1.2 | 1, 3, 4, 2, 5, 6 |
| Independent student work | 20 | 0.8 | 3, 4, 5 |

Assessment

The evaluation activities are the following:

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 - Exams (2 partials) to consolidate the theoretical and applied knowledge on the Methods and Techniques of spatial analysis in Geography.

The continuous evaluation makes the delivery of all the learning activities obligatory to be able to pass the subject. Each partial must be approved with a 5 to be able to do half with the other activities.

The exercises delivered after the deadline will have a maximum score of 5.

In order to be eligible for examination it is MANDATORY to have submitted all the exercises. The delivery may not be made after the examination date. In the case of not making the deliveries, the student will not be able to submit to the exam.

The delivery of 70% of the course activity will be Suspense. Those who do not reach 70% will have a non-valuable

RE-EVALUATION

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

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.

NOTE

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 |
|-------------------|-----------|-------|------|-------------------|
| Classe attendance | 10% | 0 | 0 | 1, 3, 4, 2, 5, 6 |
| Course exercises | 35% | 10 | 0.4 | 1, 3, 4, 2, 5 |

| | | | | |
|-------------|-----|----|------|------------------|
| Course work | 20% | 15 | 0.6 | 1, 3, 4, 2, 5, 6 |
| Exam | 35% | 3 | 0.12 | 3, 4, 5 |

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, Hugué 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