Universitat Autònoma de Barcelona

2021/2022

Spatial Analysis and Models

Code: 104256
ECTS Credits: 6

Degree	Type	Year	Semester
2503710 Geography, Environmental Management and Spatial Planning	OB	3	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

Teachers

Montserrat Pallarès Barberà

Prerequisites

There is no prerequisites in this course.

Objectives and Contextualisation

Space Analysis and Models is taught in the third course in the Degree *Geografia, Medi Ambient y Planificació Territorial*.

The objectives are:

- Use the scientific method in the formalization, resolution and interpretation of Geography Models.
- To achieve the different levels of abstraction that models provide as a tool for interpreting geographical and social phenomena.
- To formulate and solve cases of spatial analysis using the different types of geographical models.
- Use of geographical information at various scales, performing the interpretation of results.
- Develop the skills of self-employed and teamwork.

Competences

- Apply the basic regional, environmental and urban legal regulations for regional and environmental planning.
- Design and manage regional, environmental and urban planning instruments.
- Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.

Learning Outcomes

1. List the basic regional, environmental and urban regulations corresponding to the government bodies responsible in Catalonia.
2. Make proposals for regional, environmental and urban planning.
3. Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.

Content

BLOCK 1. Introduction to modeling and the scientific method

1. Models: concept and type. The models of the Nodal Region by P. Haggett.
2. The scientific method. Deductive inductive. The scale in geographic analysis. The positivist and normative approaches.
3. The theoretical, normative, methodological, technical and instrumental assumptions of the models.

BLOCK 2. Theory of Networks

1. Topological networks and graphs: concepts and techniques. Compare the properties of connectivity and accessibility.
2. Connectivity models.
3. Topological accessibility models.
4. Non-topological accessibility models.

BLOCK 3. Interaction Models

1. Concept of Interaction. Variables and parameters. Types of models. The friction of distance.
2. The space unit: area and center. Efficiency of limits, movement and packaging.
3. The unrestricted gravity model.
4. Gravity models with restriction at source and in destination restriction.
5. The gravity model with double restriction: origin and destination.
6. The Population Potential model. Single Circle (MCU) and Double Circle (MCD).
7. The rupture point model.

BLOCK 4. Allocation Models

1. Assignment Models (1). General approach of allocation models.
2. Assignment Models (2). Resolution

BLOCK 5. Linear Programming and Simplex Method

1. Linear Programming (1). Introduction.
2. Linear Programming (2). Graphic Method.
3. Simplex Method (1).
4. Simplex Method (2).
5. Simplex Method (3). Computer resolution system (LINDO program).

BLOCK 6. Transport Models

1. Transport model (1). Theoretical approach.
2. Transport model (2). Prototype example
3. Transportation model (3). Example of a prototype with LINDO.

BLOCK 7. Localization Model - Assignment (L - A)

1. Theoretical approach of Models of L - A.
2. Development of model L - A.
3. Resolution of a practical case L-A.

Methodology

The methodology and evaluation proposed in this guide may undergo some modification depending on the restrictions on attendance imposed by the health authorities.

The subject is structured from supervised and autonomous supervised activities where the student will learn to develop interactively in the contents of the subject with the support of the teaching staff, at different levels.

The contents of the subject will be developed through the following activities:

- Oral presentations of teachers (in the case of the face-to-face group).
- Reading of books and articles (individual activity of the students complementary to the work of classroom).
- Exercise of classroom exercises and the computer lab based on statistical information, both in theoretical situations and in real cases.
- Research work in a small group, related to the class syllabus.

The practical activity is structured in two axes:

1. Guided and tutored practices in each of the subjects. The activities can be of different types such as: text comments, methodological and theoretical knowledge verification or problem solving (manually and through specific software).
2. Completion of a group work that combines Network Theory, Interaction Models and Location-Assignment Models.

In the different examples gender aspects will be taken into account.

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 exercices	47	1.88	2, 3
Type: Supervised			
Supervision of exercices and course work	20	0.8	1, 3
Type: Autonomous			
Own study, plannning and execution of exercices and course work	55	2.2	1, 2, 3

Assessment

The assesment activities are the following:

1 - Theoretical and practical exam to evaluate the contents. It consists of two partial examinations with a duration of one hour and a half each with a weight of 40% of the note.

Assessment of the exam: From the theoretical part the relevance of the answer will be assessed, the degree of knowledge being obtained on the subject. And, in the practical part, the approach, resolution and interpretation of the results will be assessed separately, as well as the correct execution of the calculations. To pass the exam you must have a 5 on each part of the exam.

2 - The practical part, will be carried out in group, the activities will be delivered during the semester:

2.1 - Individual assessment practices with a weight of 20% of the mark.

2.2 - Course work with a weight of 40% of the mark.

Assessment of the practices: The formal aspects, the correct calculation of the indicators (as long as this is the objective of the practice), the adequate realization of a structured analysis on the results obtained, the interpretation of the results, in the case Specific of the analyzes of the texts will be especially valued the capacity to extract and exhibit the most relevant information and relate it to the contents of the subject.

Assessment of the course work: The formal aspects, the approach of the objectives, the problem and the models used for an improvement in the planning of the services, the definition of the analysis variables, the resolution of the results, discussion, conclusions and oral presentation in class.

Continuous assessment makes the delivery of all learning activities mandatory to be able to complete the course.

The practices delivered after the date fixed by the calendar will have a maximum score of 5.

In order to take part in the examination it is necessary to have delivered all the practices.

Those who do not reach 70% of activities will have a non-valuable.

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.

RE-EVALUATION

Only people who have given ALL the evidences of the practical part (practices and course work) can only be submitted to the recovery. Recovery is for those parts of the exam that are suspended. The course exercicis can be re-evaluated in case that the average will be lower than 5.

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
Course exercices	35%	15	0.6	2, 3
Course work	25%	10	0.4	1, 2, 3
Exam	40%	3	0.12	3

Bibliography

The references will be complemented during the semester.

References

HAGGET, Peter (1988). *Geografía. Una síntesis moderna*. Barcelona: Editorial Omega.

HAGGET, Peter (1976). *Análisis locacional en geografía*. Barcelona: Gustavo Gili.

HAGGET, Peter; CLIFF, Andrew D. i FREY, Allan (1977). *Locational analysis in human geography*. Vol. I: Locational modelos. Vol. II: Locational methods. London: Edward Arnold.

HARVEY, David (1983). *Teorías, leyes y modelos en geografía*. Madrid: Alianza universidad.

ROBINSON, Guy .M. (1998). *Methods and techniques in human geography*. New York: Wiley.

Complementari References

ABLER, R. et al. [Eds.] (1972). *Spatial Organization. The Geographer s View of the World*. London: Prentice-Hall International, Inc.

ALEGRE, P. y Tull, A.F. (1986). "Métodos de cuantificación aplicados a la planificación territorial yurbana". Asociación de Geógrafos Españoles [Ed] *Métodos cuantitativos en geografía: Enseñanza*, investigación y planeamiento. Madrid: A.G.E; pp. 240-267.

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CHISHOLM, M (1968). *Geografía y Economía*. Vilassar de Mar: Oikos-Tau.

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KILL, J. (1983). *Mathematical programming methods for Geographers and planners*. London and New York: Croom Helm and St.Martin s Press.

TAYLOR, P. J. (1977). *Quantitative methods in geography. Prospect Heights. An Introduction to Spatial Analysis*. Boston: Houghton Mifflin Company.

THOMAS, R.W. y HUGGET, R.J. (1980). *Modelling in geography. A mathematical approach*. London: Harper & Row, Publishers.

Software

Software:

LINDO