UAB
Universitat Autònoma de Barcelona

Geographical Information Systems, Planning and Landscape

Code: 44470
ECTS Credits: 6

2024/2025

Degree	Type	Year
4317520 Territorial Studies and Planning	OT	0

Contact

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Teachers

(External) Joan-Cristian Padró Garcia

Teaching groups languages

You can view this information at the end of this
document.

Prerequisites

This module is an introduction to Geographic Information Systems (GIS), learning basic concepts, as well as basic skills in the most commonly used GIS software in the professional field. That is why before starting the practical sessions it is essential that those students who have not taken any GIS subject or know software like the MiraMon, ArcGis or QGIS, take the subject. The essential basic notions in GIS will be obtained, both from a conceptual and instrumental point of view.

Objectives and Contextualisation

The need to use GIS as support for urban planning tasks and the analysis of the territory is indisputable. Their ability to easily interrelate the spatial and thematic components make them an essential tool for all planning tasks that aim to establish a principle of rationality and territorial balance. Therefore, it is a cross-sectional analysis tool to the rest of the modules of this master's degree, which at the same time allows the territorial dynamics to be easily incorporated into the analysis from the comparison of different moments. A key aspect when facing urban and territorial planning. With GIS we make a first visual inspection of the territory through different cartographic sources and at different scales to answer the question, where are the different geographic objects located?; but also, from the spatial analysis, we must dare to propose where they should be located. These proposals do not only start from an instrumental knowledge of the cartographic technique but must be fed with the theoretical and practical knowledge of land use planning and the instruments of urban analysis, which must allow us to establish more rational management and planning criteria. Therefore, following the theoretical principles on which the study of land uses is based, practical work will be done with the GIS that will consist of analyzing at different scales and in different areas. By doing so, the objective is to provide the planning with the empirical analysis provided by the GIS tools. This module is designed so that the

student can, on the one hand, become familiar with the concepts that allow understanding the fundamentals of GIS for urban analysis and land uses, and on the other, achieve the instrumental skills necessary to know use GIS in territorial planning tasks.

The specific objectives of this module are:

A) Achieve solid knowledge based on the conceptual and methodological foundations of GIS applied to territorial planning. It is not intended to train in a specific GIS software, but ratherto learn and master the tool from the need posed by the elaboration of the different basic maps for the creation of final maps.

B) Know (or learn if necessary) the necessary concepts and understand what strategies should be applied. Know what tools you have at your disposal to find the functionalities you need from the program in each case and know how to choose or adapt to the possibilities that you will find to solve management and planning problems of the territory.

C) Design and formulate proposals in the management of urban analysis that consider territorial planning.

Learning Outcomes

1. CA20 (Competence) Explain spatial analysis results in specific cases related to environmental and territorial planning and risk assessment.
2. CA21 (Competence) Identify how useful GIS can be both conceptually and for solving planning and management problems.
3. CA22 (Competence) Use GIS to demonstrate different socio-economic realities of the areas of study in urban planning processes.
4. CA23 (Competence) Project models and examples of different problems related to environmental planning using relevant environmental cartography.
5. KA19 (Knowledge) Recognise the advanced methodology used in territorial analysis and urban planning.
6. KA20 (Knowledge) Map and analyse situations from a perspective of urban and territorial imbalances.
7. KA21 (Knowledge) Draw on key concepts to prepare landscape catalogues, landscape maps, impact studies and landscape integration while focusing particularly on citizen participation processes.
8. SA16 (Skill) Classify territorial and urban change at different scales (micro, meso, macro) as the focus of geographical research.
9. SA17 (Skill) Use GIS to interpret visual variables related to territorial management and planning and urban planning.
10. SA18 (Skill) Choose GIS applied to the modern geographical landscape.
11. SA19 (Skill) Use GIS both conceptually and to solve planning and management problems.

Content

GIS data sources and tools for mapping.

Map composition.

Main tools for spatial representation of socioeconomic and environmental variables.

Use of spatial analysis tools.

Graphic representation of territorial and urban changes.

Elaboration of maps at neighborhood level and / or census sections.

Digitization of new layers.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Practical classes	22.5	0.9	CA20, CA23, KA19
Theoretical classes	7.5	0.3	KA21
Type: Supervised			
Field trip	5	0.2	SA17
Workshops	20	0.8	SA16
Type: Autonomous			
Carry out practices	20	0.8	CA22, SA19
Core work development	54	2.16	CA20, CA21, CA22, CA23, KA19, KA20, KA21, SA16, SA17, SA18, SA19
Self study	10	0.4	CA21

Teaching is organized through theoretical and practical classes. The practices will be supported by specific and affordable GIS and remote sensing software: QGIS or MiraMon.

Activities that cannot be done in person will be adapted to the possibilities offered by the UAB's virtual tools. The exercises, projects and theoretical classes will be carried out through virtual tools, such as tutorials, videos, Teams sessions, etc. The teacher will ensure that the student can access or offer alternative means, which are within their reach.

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
Individual practices	20%	7	0.28	CA21, CA22, KA20, SA16, SA17, SA18, SA19
Presentation of core work (Work: 50%, Oral presentation: 15%)	65%	1	0.04	CA20, CA21, CA22, CA23, KA19, KA20, KA21, SA16, SA17, SA18, SA19
Written test	15%	3	0.12	CA20, CA21, CA23, KA19, KA21, SA16, SA17, SA19

EVALUATION

<u>Subject-specific activities: 35%</u>

Written test: 15%

Individual and group practices: 20%

<u>Core project: 65%</u>

Core project report: 40%

Core project poster: 15%

Oral defense of the project: 10%

To pass the subject, it will be necessary to obtain a grade equal to or higher than 5 in both the individual exercise and the overall grade of the core project.

If the 5 is not exceeded, it will be possible to recover two evaluative evidences:

- Recover the grade of the individual exercise: by repeating the exercise.

- Recover the grade of the core project: by taking an oral exam of the content worked on in the core group.

To have the right to recovery, all the evidence related to the main project must have been presented.

Those students who have not presented all the evidence of the trunk project will be NON-EVALUABLE

VERY IMPORTANT: Total or partial plagiary of any of the exercises will automatically be considered "fail" (0) for the plagiarized item. Plagiary is copying one or more sentences from unidentified sources, presenting it as original work (THIS INCLUDES COPYING PHRASES OR FRAGMENTS FROM THE INTERNET AND ADDING THEM WITHOUT MODIFICATION TO A TEXT WHICH IS PRESENTED AS ORIGINAL). Plagiarism is a serious offense. Students must learn to respect the intellectual property of others, identifying any source they may use, and take responsibility for the originality and authenticity of the texts they produce.

In the event that assessment activities 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.

This subject does not incorporate single assessment

Bibliography

Bolstad, Paul (2016) GIS Fundamentals. Available in: http://www.paulbolstad.net/gisbook.html

Bonham-Carter, Graeme F. (1994) Geographic information systems for geoscientists modelling with GIS, Pergamon. Kidlington. 398 p.

Burrought, Peter A. & McDonnel, Richard A. (1998) Principles of Geographical Information Systems (2ondEdition). Oxford University Press.

Laurini, Robert & Tompson, Derek (1992) Fundamentals of Spatial Information Systems Academic Press. Londres. 680 p.

Longley, Paul A. Goodchild, Michael F. Maguire, David J. & Rhind, David W. (2005) Geographical InformationSystems and Science. John Wiley & Sons.

Maguire, David J., Goodchild Michael F. i Rhind, David W. (eds.) (1991) Geographical Information Systems.Principles and Applications. 2 Vol. Longman Scienti Technical. Essex. 649+447 p.

Oyala, Víctor (2011) Sistemas de Información Geográfica (https://github.com/volaya/libro-sig/releases/).

Santos Preciado, José Miguel (2004) "Sistemas de información geográfica. Unidad didáctica".(60105UD01A01) UNED. Madrid. 460 p. ISBN: 84-362-2006-4.

Webography:

MiraMon reference manual: https://www.miramon.cat/help/spa/mm32/manualrf.htm

QGIS training manual: https://docs.qgis.org/2.14/es/docs/training_manual/

QGIS user guide: https://docs.qgis.org/2.14/es/docs/user_manual/index.html

ArcMap training manual: https://desktop.arcgis.com/es/arcmap/latest/get-started/introduction/arcgis-tutorials.htm

Oyala, Víctor(2011) Sistemas de Información Geográfica (https://github.com/volaya/libro-sig/releases/).

Joan-Cristian Padró youtube channel (Tutorials SIG català): https://www.youtube.com/playlist?list=PL-jTd-6Ai5J_fu8u4m_1EZDhNJXZ0lxqi

Software

SOFTWARE:

Text editing software, spreadsheets, and presentations:

Office package (Word, Excel and PowerPoint) or LibreOffice

Notepad or Notepad ++

GIS specific software:

MiraMon and/or QGIS

The evaluable exercises and works will be presented in such a way that any of the three indicated GIS software can be used.

Language list

Name	Group	Language	Semester	Turn
(TEm) Theory (master)	1	Catalan	first semester	afternoon