UAB
Universitat Autònoma de Barcelona

Geographic Information Systems

2026/2027

Code: 107587
Credits: 6

Degree programme	Type	Course
Geography, Environmental Management and Regional Planning	OB	1

Contact lecturer

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Teaching staff

Josep Gili Prat

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Group languages

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

Prerequisites

In order to follow this subject without any difficulties, it is recommended to have gained the knowledge of the first semester subject Introduction to Cartography.

To take this subject, you must have a command of Catalan and/or Spanish equal to or higher than level B2.

Objectives

Theoretical and practical subject that provides an introduction to the field of Geographic Information Systems (GIS). One of the main objectives is to gain a good knowledge of how to deal with and analyse the located data on the land, by consolidating the theoretical aspects and the use of specific programs. The objective of teaching Geographic Information Systems is to gain some knowledge based on the conceptual and methodological basis. When finishing this subject, students need to know how to apply the acquired abilities to the needs required in other subjects through the consolidation of both the theoretical and practical aspects that have been developed. This implies knowing not only how to use GIS, but also to understand what is done when we work with them and why they are used.

Therefore, a double objective related to the theoretical and practical content of the subject is set: The conceptual context around GIS and all the abilities that require the use of GIS. At a general level, the main aim is to know and understand what GIS are, why they are used, how they work and when you need to use them.

At a conceptual level, the following objectives are set:

- Understanding the nature of geographic information and the tools needed for its use
- Knowing and understanding the two data structures used for modelling the reality
- Knowing how to introduce, structure and store geographic information, as well as the main handling and

analysis functions of GIS
- Knowing the main data sources of GIS
- Understanding and knowing how to make the most of information systems as a tool to obtain answers to specific types of questions
- Knowing what types of actions are correct in each case in order to solve specific needs
- Gaining practical experience in solving problems typically found in the field

In the second case, the acquisition of skills, it is expected to provide students with the methodological tools that enable them to use GIS so they know what can be done, how it can be done and where it can be applied:

- Understanding and knowing how to make the most of information systems as a tool to obtain answers to specific types of questions
- Knowing what types of actions are correct in each case in order to solve specific needs
- Gaining practical experience in solving problems usually found in the geographic and territorial field.

From the objectives defined before, we are aiming to achieve a continuous interaction between theory and practice.

Learning outcomes

- CM27 (Use geographical information systems as a tool to obtain answers to certain questions related to geoinformation.) Use geographical information systems as a tool to obtain answers to certain questions related to geoinformation.
- KM42 (Recognise the two data models used to represent reality (vector and raster data models).) Recognise the two data models used to represent reality (vector and raster data models).
- SM37 (Compare different interpretations of geographical maps.) Compare different interpretations of geographical maps.

Contents

Block 0: GIS background

GIS History

Definition, components and GIS functions

Block 1: Geographic information

Information on the land and on phenomena in the land

Geographic and non-geographic organisations

Nature of the geographic information

The value of georeferenced information

Block 2: Data models in GIS

Raster model

Vector model

Data sources and publishing on the Internet

Block 3: Introduction to GIS use. Spatial analyst

Cartographic modelling and analysis

Proximity analysis

Block 4: Georeference

Localisation as a connecting factor

Basic georeference methods

Main reference systems

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Individual and collective work tutored by teachers	25	1	CM27
Lectures with IT support	15	0.6	KM42, SM37
Creation of practical tasks using specific programs and the recommended bibliography. Self-study	69	2.76	CM27, SM37
Practical tasks in class guided by the teachers / Guidelines for developing the practical tasks	29	1.16	CM27, KM42

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

- Oral presentations by the teaching staff.
- Reading complementary articles in the syllabus (individual activity of the students complementary to the classroom work, which will be evaluated in the theoretical exams).
- Class practices guided by the teaching staff.
- Sequence of individual and/or small group class practices.

In this subject, it is essential to bring a pen drive with at least 2 GB of capacity to class.

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	Weight	Hours	ECTS	Learning outcomes
C. Practical exercises delivered throughout the course	40%	6	0.24	CM27, KM42
B. Practical exams	30%	5	0.2	CM27
A. Theory exams	30%	1	0.04	KM42, SM37

The continuous assessment activities are:

- Mid-term theory exams (30%): there will be two partial theoretical exams, one halfway through the course and the other at the end of the course. The grades of these two exams will be averaged between them without a minimum grade, both with an equal weight.
- Mid-term practical exams (30%): there will be two partial Practical exams, one halfway through the course and the other at the end of the course. The grades of these two exams will be averaged between them without a minimum grade, both with an equal weight.
- Practical exercises: 4 or 5 practical exercises will have to be delivered during the course. The planned delivery schedule will be presented at the beginning of the course. The grades for these exercises will be averaged together, with no minimum grade requirement, and each exercise will carry equal weight.
- Attendance and participation in class: will be counted from small activities carried out in class without prior notice. It can contribute up to 1 additional point to the final grade.

The average between the grade of the theoretical exam (average of the two theoretical parts) and the grade of the practical exam (the average of the two practical parts) is only computed if a minimum grade of 4 is reach in both parts, and students will only pass the exams if the average of their qualifications is at least a 5. It is mandatory to hand in the practical exercises. Nevertheless, the non-submission of one assignment throughout the course is permitted, and it will be counted as a 0 in the calculation of the practical assignments grade. Sitting the exam will not be permitted if 2 or more assignments are missing. An extraordinary delivery date will be defined for the practical tasks not delivered within the originally established deadline, or delivered on time but suspended. Practical exercises delivered within this extraordinary period will be scored with a maximum grade of 5.

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.

This subject does not incorporate single assessment.

Erasmus and exchange students who request to advance an exam must present a document from their home university justifying their request.

RESIT EXAM

Once the ordinary assessmenthas been completed, students will have the opportunity to takea resit exam within the dates scheduled by the Faculty. To participate in this exam the students must have been previously evaluated in a set of activities whose weight is equivalent to a minimum of 2/3 of the total qualification of the subject.

NOT EVALUATED

If the student has not delivered anything, not attended to any laboratory session and not done any exam, the corresponding result will be "Not assessed". In any other case, "not delivered" counts as a 0 for the weighted average that will be maximum a 4.5. Therefore, if students participate in an evaluated activity, it implies taking into account the "not delivered" in other activities as zeros.

FIRST CLASS HONOURS

First class honours will be awarded to those students that obtain a result of 9.5 or over in each part, up to 5% of those registered following a descending order of the final result.

REPEAT STUDENTS

Students who are repeating the subject will not be treated differently.

COPIES AND PLAGIARISMS

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.

AI USE

In this subject, the use of Artificial Intelligence (AI) technologies is not allowed in any of its phases.Any work that includes fragments generated with AI will be considered a lack of academic honesty and may lead to a partial or total penalty in the grade of the activity, or greater sanctions in serious cases.

Bibliography

- Bonham-Carter, Graeme F. (1994) Geographic information systems for geoscientists modelling with GIS, Pergamon. Kidlington. 398 p.
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- Bosque Sendra, Joaquín; García, Rosa Corina (2000), El uso de los sistemas de información geográfica en la planificación territorial. *Anales de Geografía de la Universidad Complutense*, 20: 49-67.
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- Laurini, Robert; Tompson, Derek (1992) Fundamentals of Spatial Information Systems Academic Press. Londres. 680 p.
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- Oyala, Víctor (2011). Sistemas de Información Geográfica.
- Available in https://volaya.github.io/libro-sig/

Software

Specific software for Geographic Information Systems (GIS): ArcGIS Pro and MiraMon.

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this link. To access the information, you will need to enter the course CODE

Type of teaching	Group	Language	Semester	Shift
(TE) Theory	1	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	1	Catalan	second semester	morning-mixed
(TE) Theory	2	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	2	Catalan	second semester	morning-mixed
(TE) Theory	3	Catalan	second	morning-mixed

			semester	
(PLAB) Practical laboratories	3	Catalan	second semester	morning-mixed