Geographical Information Systems

Code: 100735
ECTS Credits: 6

2025/2026

Degree	Type	Year
Archaeology	OT	4

Contact

Name: Ermengol Gassiot Ballbe

Email: ermengol.gassiot@uab.cat

Teachers

Miquel Nieto i Conill

Teaching groups languages

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

Prerequisites

Archaeology

Students enrolled in this course should have passed previously the course *Introduction to cartography* from the Archaeology Degree.

Objectives and Contextualisation

Geographic information systems are a very useful tool in archaeology in many ways: managing and consulting data from archaeological surveys and excavations, cartographic representation of results, spatial analysis (from micro to macro levels), etc.

In accordance with the subject's objectives, and building on the content of courses 106867 - Digital Cartography (2024-25) and 106868 - Landscape and Territory, this course has three specific objectives:

1. To provide the foundations for understanding the functioning and correct use of geographic information systems and database management systems, both alphanumeric and spatial.

2. To provide systematic knowledge of the main methodologies and operations of geographic information systems applicable to archaeological analysis, using examples and case studies specifically related to archaeology.

3. To analyze several cases of the use of Geographic Information Systems to solve archaeological problems in various periods of prehistory and history and geographical areas, and to introduce students to the basic aspects of these applications.

Competences

- Carrying out and managing archaeology fieldwork: excavation and survey.
- Managing the main methods, techniques and analytic tools in archaeology.
- 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.
- Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
- Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.

Learning Outcomes

1. Apply spatial relations on different regional scales through the relations between nature and society and through a temporal dimension.
2. Applying implementing protocols of fieldwork and sample collection.
3. Collect data in the field by using some of the basic measurement tools (GPS, total station).
4. Combining technical resources from similar disciplines.
5. Develop and use cartographic representations of real phenomena.
6. Identify appropriate technical solutions for practical needs to be resolved.
7. Identify the theoretical concepts that provide a foundation for technical operations.
8. Interpret maps and extract knowledge about spatial relations and their effect on material and cultural processes in societies.
9. Obtain and organise adequate data for each practical need to be solved.
10. Produce and organise cartographic data to resolve cartographic needs in archaeology.
11. Produce conventional graphic documents: planimetric, topographic, cartographic, illustrative drawing.
12. Produce maps from digital cartographic data, by using technical knowledge compilation, symbolization and cartographic design.
13. Use software of geographical information system to produce and transform digital cartographic data and creating maps.
14. Using computing tools, both basics (word processor or databases, for example) and specialised software needed in the professional practice.
15. Using the specific interpretational and technical vocabulary of the discipline.

Content

Block I. Introduction

1. Introduction: Geographic Information Systems (GIS)

a. What are they?

b. Brief history

c. Principles of operation and analysis

2. Geographic Information Systems in archaeology: a brief history of their application

Block II. GIS and database management

3. Database management systems.

4. Spatial data management

a. Introduction to geodatabases

b. Geodatabases in archaeology

Block III. GIS and spatial data analysis in archaeology

5. Resources: thematic cartography

a. Main sources of thematic cartography useful in archaeology

b. Strengths and limitations of different types of thematic cartography for archaeological analysis

6. Analysis of settlement patterns and systems

a. Sites and deposits: multivariable characterization of their locations

b. Patterns of dispersion and agglomeration

7. Analysis of territorial control and visual landscapes

a. Visual conques

b. Intervisibility relationships

8. Analysis of settlements and resources: from catchment areas to cost distance areas

9. Mobility analysis:

a. Optimal paths or minimum cost paths

b. Network analysis

10. Micro-space analysis: activity areas

11. Models of archaeological presence probability. Brief introduction to spatial modeling in archaeology

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Guided exercises, either guided by teachers or using detailed tutorials	30	1.2	11, 12, 9, 3, 10, 13
Lectures with TIC support	20	0.8	1, 5, 7, 8, 15
Type: Supervised			
Exercises carried out by the students outside the classroom, according to a work plan supervised and evaluated by the lecturer	21	0.84	1, 2, 4, 5, 11, 12, 7, 6, 8, 9, 3, 10, 15, 13
Type: Autonomous			
Exercises done by the students according to a work plan. Personal readings	75	3	1, 2, 4, 5, 11, 12, 7, 6, 8, 9, 3, 10,

Archaeology

Theoretical and methodological subjects are introduced with concise lectures and are developed by the autonomous work done by the students, which includes studying specific course materials (class notes provided for all the subjectes) available at UAB Virtual Campus and general readings (bilbiography and web resources).

Technical abilities are acquired by a set of guided exercises done by the students in a computer lab during the teaching period or on their own.

For each subject students will do 1 or 2 exercises at an approximate rate of one exercise per week.

All the course resources (class notes, exercises, quizzes, documents and data) are available online at UAB Virtual Campus (a Moodle based e-learning platform).

The activities that cannot be done in person will be adapted to the possibilities offered by the UAB 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, when available.

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
Partial practical exams	30%	2	0.08	5, 11, 12, 8, 9, 3, 10, 13, 14
Partial theoretical exams	30%	2	0.08	1, 2, 4, 7, 6, 8, 15
Practical exercises	40%	0	0	5, 11, 12, 9, 3, 10, 13, 14

Evaluation of this course is continuous and is based on the outcome of the practical exercises, either guided or autonomous. All the execises should be submitted in the time scheduled. Assignments not submited in time can be

submited at the end of the semester (several days before the final exam).

All the exercises are mandatory and have to be done individually. The average of all assignment grades is the exercises grade. Exercises can not be retaken nor re-evaluated.

The exercises grade must be validated passing a final exam at the end of the semester (first week of June).

To pass the course students have to:

- ***submit at least 80% of the exercises assigned*** to have the right to attend to the final exam.

- ***pass the final (or recovery) exam with a minimum grade of 5 over 10***.

Once the final (or recovery exam) is passed, the final grade of the course will be the highest grade, either the exercises grade or the exam grade.

RECOVERY: Students that do not pass the final exam will have the right to do a recovery exam two weeks later, in the date scheduled by the school. Requirements for attending to the recovery exam are the same for attending to the final exam (80% of the exercises submitted).

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.

UAB regulations regarding plagiarism and other irregularities in the evaluation process:

In the event of a student committing any irregularity that may lead to a significant variation inthe 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.

This subject does not incorporate single assessment.

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Software

GIS Software (free) > QGIS: https://qgis.org

GIS Software > Campus License GIS ArcGIS.

>> License: https://forms.office.com/r/1QijPDxH0a

>> Support and Resources: https://bit.ly/SIGCampusUAB

Software DBMS and office:

>> Microsoft 365: https://si-respostes.uab.cat/inici/correu/msop-microsoft-office

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
(PLAB) Practical laboratories	1	Catalan	second semester	morning-mixed
(TE) Theory	1	Catalan	second semester	morning-mixed