UAB
Universitat Autònoma de Barcelona

Geospatial Data

2026/2027

Code: 43845
Credits: 6

Degree programme	Type	Course
Geoinformation	OB	1

Contact lecturer

Name : Meritxell Gisbert Traveria

Email : meritxell.gisbert@uab.cat

Teaching staff

Dolors Barrot Feixat

Group languages

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

Prerequisites

This course has no specific requirements. Students should only have a basic knowledge of using general software such as Windows, Excel and Word.

Objectives

The aim of the course is to provide advanced knowledge of the data models and standards for geographic information with special focus on international data and metadata standards, both european (INSPIRE) and global (OGC and ISO).

The course also covers the principles of geospatial information representation, oriented to cartographic production and digital (web services and mobile apps) and analog (printable documents) publishing of geoinformation

Finnally, the course includes a revision of the principles and properties of spatial reference systems with focus on specifications and case studies.

Learning outcomes

- CA01 (Generate geospatial data geovisualisation products that provide a basis or opportunity to be original in the development and/or application of ideas.) Generate geospatial data geovisualisation products that provide a basis or opportunity to be original in the development and/or application of ideas.
- CA02 (Integrate geospatial information technologies, services and applications in order to provide the optimal solution to each case.) Integrate geospatial information technologies, services and applications in order to provide the optimal solution to each case.

- KA01 (Distinguish the characteristics of standard data models for geospatial data, visual variables and their required properties, and the principles and methods to produce thematic maps.) Distinguish the characteristics of standard data models for geospatial data, visual variables and their required properties, and the principles and methods to produce thematic maps.
- KA02 (Select the suitable data models and geospatial information standards and cartographic design principles to compose cartographies for different corporate or public analogue or digital publication media.) Select the suitable data models and geospatial information standards and cartographic design principles to compose cartographies for different corporate or public analogue or digital publication media.
- KA03 (Recognise the importance and usefulness of metadata in the production and use of geospatial data, taking into account ethical responsibility, legislation, and the societal implications of use.) Recognise the importance and usefulness of metadata in the production and use of geospatial data, taking into account ethical responsibility, legislation, and the societal implications of use.
- SA01 (Determine the most suitable geospatial data format and visual variables for each product or application, based on the thematic variables to be represented.) Determine the most suitable geospatial data format and visual variables for each product or application, based on the thematic variables to be represented.
- SA02 (Design cartographic documents and, in general, geospatial data geovisualisation products, and the analogue and digital production and publication processes.) Design cartographic documents and, in general, geospatial data geovisualisation products, and the analogue and digital production and publication processes.
- SA03 (Assess the different components of geographic data quality as well as sources by identifying the limitations of different geospatial data formats and standards.) Assess the different components of geographic data quality as well as sources by identifying the limitations of different geospatial data formats and standards.

Contents

Geoinformation visualization and design

1. Basic principles of cartographic representation.

2. Cartographic and visual communication. Visual variables and graphic design elements.

3. Colour modelling and treatment.

4. Visualization of geospatial data.

5. Thematic maps.

6. Simbolisation and cartographic semiology.

7. Graphic and cartographic design.

8. Cartographic edition software. Structure and functionality.

9. Processing and symbolization of raster data for visualization and cartographic presentation.

10. Design of web maps and interactive applications with ArcGIS Online.

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Readings, personal study and exercises	69	2.76	
Lectures on basic concepts and practical exercises	36	1.44	
Semester project, exercises	15	0.6	

Learning is achieved by means of three types of activities:

Directed activities: Directed activities are theoretical and practical lectures in a computer lab. They include solving case studies and practical exercises, using as the main method a problem based learning approach. Lectures serve to systematize all the content, to present the state of the art of the different subjects, to provide methods and techniques for specific tasks, and to sum up the knowledge to learn. Lectures organize also the autonomous and complementary work done by the students.

Supervised activities: Supervised activities are focused on the execution of a semester project, consisting of a real case study, carried out through workshop hours, autonomous work and tutorials. This semester project allows to apply together all the knowledge and technical skills learnt in all the courses of the semester. The semester project is a milestone for the students and the actual demonstration that they had achieved the learning goals of all the courses of the semester. It is also the main evidence for evaluation as students should have to submit at the end of the semester a report that summarizes the whole project and do an oral presentation.

Autonomous activities: Autonomous work of the students includes personal readings (papers, manuals, relevant reports, etc.), data and documentation search, complementary exercises and the personal development of the semester project.

The activities that could not be done onsite will be adapted to an online format made available through the UAB's virtual tools. Exercises, projects and lectures will be carried out using virtual tools such as tutorials, videos, Teams sessions, etc. Lecturers will ensure that students are able to access these virtual tools, or will offer them feasible alternatives.

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
Report submissions	45	13.5	0.54	CA01, CA02, KA01, KA02, SA01, SA02, SA03
Practical exercises	35	10.5	0.42	CA01, KA01, KA03, SA02, SA03
Oral presentations	20	6	0.24	CA01, CA02, KA02, KA03, SA01, SA03

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.

CONTINUOUS EVALUATION. This subject/module does not incorporate single assessment.

a) Evaluation procedure and activities:

Evaluation of the course is based mostly on the semester project, that comprises two evaluation activities. The elaboration and submission of a synthesis report and the oral presentation of the project done. Given the technical content of the course, the weight assigned to the project report is 45% of the total course grading, assuming that it is the most appropriate means to explain all the technical details of the project, and a weight of 20% at the oral presentation. The course assessment is completed with the evaluation of the practical exercises done along the course, that account for another 35% of the total course grading.

Unless otherwise specified, the submission of exercises is mandatory. In order for the exercises to be averaged with the project, they must have an average grade of 5 or higher.

Except when expressly noticed, all the evaluation activities (report and oral presentation of the semester project, as well as practical exercises) have to carried out individually.

Time assigned to each evaluation activity includes the time spent in making all the material evidences for evaluating each activity (e.g., writing of the report, preparing the presentation slides, etc.).

b) Evaluation schedule:

1st semester project report: Making during all the semester. Submission at the end of semester, on January 22nd 2027.

1st semester project oral presentation: Making during all the semester. Oral presentation at the end of semester, on January 28th 2027.

Course practical exercises: Making and submission weekly or biweekly along the semester.

c) Grade revision:

Once the grades obtained are published, students will have one week to apply for a grade revision by arranging an appointment with the corresponding teachers.

d) Procedure for reassessment:

1st semester project report: It could be reassessed in the following two weeks after the submission date scheduled. Reassessment will require the submission of a new whole report in case of negative evaluation of the former report submitted.

1st semester project oral presentation: It could be reassessed in the following week after the date scheduled for the oral presentation. Reassessment will require doing again the oral presentation in case of negative evaluation of the former presentation done.

Course practical exercises: Can not be reassessed.

To have right to a reassessment the student will have to have been previously evaluated in a set of activities that account for at least two thirds of the total course grading. Therefore he or she will have to have been evaluated of the 1st semester project report (45%) and ofthe 1st semester project oral presentation(20%) inthe dates scheduled.

The right to a reassessment will only be granted to students that, having not passed the course (e.g., having a total course grade below 5 over 10), had obtained at least a total course grade above 3,5 over 10.

e) Conditions for a 'Not assessable' grade:

Students will receive the grade 'Not assessable' instead of 'Fail' if they had not submitted neither the 1st semester project report nor done the 1st semester project oral presentation. Students will obtain a Not assessed/Not submitted course grade unless they have submitted more than 1/3 of the assessment items.

f) UAB regulations on plagiarism and other irregularities in the assessment process:

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..

Assessment acitivities with a zero grade because of irregularities can not be reassessed.

On carrying out each evaluation activity, lecturers will inform students of the procedures to be followed for reviewing all grades awarded, and the date on which such a review will take place.

For this subject, the use of Artificial Intelligence (AI) technologies is permitted exclusively for support tasks. Students must clearly identify which parts have been generated with this technology, specify the tools used, and include a critical reflection on how these have influenced the process and the final outcome of the activity. Non-transparency in the use of AI in this assessable activity will be considered a lack of academic honesty and may lead to a partial or total penalty in the activity's grade, or more severe sanctions in serious cases.

Bibliography

Aguilera Arilla, María José [et al.]. Fuentes, tratamiento y representación de la información geográfica. Madrid: Universidad Nacional de Educación a Distancia, 2003. 421 p. (Unidades Didácticas) ISBN 8436249046.

Bernabé, M. A.; Iturrioz, T. Elementos de diseño cartográfico. Universidad Politécnica de Madrid. Escuela Universitaria Ingeniería Técnica Topográfica, 1996. 305 p.

Dent, B.; Torguson, J. and Hodler, T. (2008) Cartography: Thematic Map Design. 6th edition. Boston: WCB/McGrawHill.

Maceachren, A. M.; Fraser Taylor, D.R.(ed.) (1994): Visualization in modern cartography. Elsevier.

Robinson, A.H.; Morrison, J.L.; Muehrcke, P.C. and Kimerling, A.J. (1987) Elementos de cartografía. Barcelona: Ediciones Omega. (trad. en castellà de la 5ª edició)

Santos Preciado, José Miguel. El tratamiento informático de la información geográfica. Madrid: Universidad Nacional de Educación a Distancia, 2002. 380 p. (Cuadernos de la UNED) ISBN 8436246268.

Slocum, T. A. (2009): Thematic cartography and geovisualization. Prentice Hall.

Software

ArcGis Desktop

ArcGis Pro

ArcGis Online

Qgis

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
(TEm) Theory (master)	1	Spanish	first semester	afternoon
(PLABm) Practical laboratories (master)	1	Catalan/Spanish	first semester	afternoon