COURSE DATA

DATA SUBJECT

Code: 33805
Name: Geographical Information Systems II
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1318 - Degree in Geography and the Environment	Facultat de Geografia i Història	3	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1318 - Degree in Geography and the Environment	Geographic information systems II	COMPULSORY

COORDINATION

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SUMMARY

Geographic Information Systems (GIS) are formed by the integration of geographic data systems and computer applications in order to allow the analysis, understanding and visualization of complex issues of geographical knowledge that entail the spatial distribution of the variables involved. This course complete the content entered in SIG I (second course, second semester), deepening the functions of input of tabular data and cartographic representation, and presenting the functions of selection and management of information, geoprocessing, spatial analysis, network analysis and cartographic modeling.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

It is necessary to have completed and passed previously SIG I

COMPETENCES / LEARNING OUTCOMES

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Be able to produce statistical information. Know how to use statistical software.

Be able to relate and synthesise cross-disciplinary territorial information.

Be able to use cartography and geographic information systems.

Be able to work independently.

Be able to work in interdisciplinary teams.

Get acquainted with geographic information systems as a tool for learning about and interpreting the territory and the environment.

Have computer skills related to the field of study.

Have oral and written communication skills in one's own language and in a foreign language.

Have research skills.

Learn about geographic information systems.

Show motivation for quality, responsibility and intellectual honesty.

DESCRIPTION OF CONTENTS

1. Introduction: Spatial databases and working with GIS tables and layers

The concept and operation of spatial databases will be studied. The main tools for data entry, selection, and management will be introduced and applied, with an emphasis on techniques for incorporating data tables into GIS and linking or converting them to spatial data.

2. Geoprocessing and spatial analysis

The operation of the main GIS functions for spatial data management, overlay, and proximity will be covered. Spatial modeling tools will be introduced.

3. Analysis in raster format

An in-depth understanding of raster analysis tools, such as viewshed analysis, will be developed. Raster analysis functions for density, zonal statistics, and distance analysis will be covered.

4. Network analysis and spatial statistics in vector format

Using the Network Analyst module, students will learn to obtain optimal routes and service areas in GIS.

5. Introduction to spatial statistics

The main tools of spatial statistics, such as the calculation of centrality-dispersion measures, randomness tests in distribution, and spatial pattern analysis, will be introduced and applied.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	30,00
Other activities	15,00
Computer classroom practice	15,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	0,00
Preparation of lessons	60,00
Preparation for assessment activities	30,00
Resolution of case studies	0,00
Total hours	**90,00**

TEACHING METHODOLOGY

PRESENCE ACTIVITIES (40% of the students' dedication). Include all activities that require the physical presence of the student (classes, tests, tutor meetings...)

- Magisterial-teaching or participative-theoretical classes: 30 hours.
- Practices classes: 15 hours.
- Complementary activities and individual tutor meetings: 15 hours.

NON-PRESENCE ACTIVITIES (60%) of students' dedication

- Student's autonomous work

The acquisition of the skills listed in the above paragraph, requires the provision of theoretical and practical classes. Both will be taught in computer classroom. In the theory classes will explain the concepts and the procedures to be followed. Through the implementation of the practices the student will become familiar with the methodological knowledge and resolution of cases applied.

EVALUATION

The system of evaluation does not reside solely in the evaluation of the evidence review, but that will be a continuous process throughout the semester. In the final rating will be combined the valuation of work directed - which include exercises and practices of the course - and the results of the follow-up activities, which include seminars, conferences, written tests or exams and others.

The model of evaluation shall conform to the following percentages:

- Exam: 60%

- Work and practices addressed: 30%

- Complementary activities: 10%

The ratings system will follow the rules of the Universitat de Valencia, adopted by the Consell de Govern the day January 27 2004. (In accordance with the RR.DD. 1044/2003 AND 1125/2003)

The second call will evaluate the theoretical and practical criteria of the subject in the same way as in the first call.

REFERENCES

Basic
- Moreno Jiménez, A., coord. (2005): Sistemas y Análisis de la Información Geográfica. Manual de autoaprendizaje con ArcGis, Ra-Ma, Madrid

Additional
- Burrough, Peter A. y McDonnell, Rachael A. (2000): Principles of geographical information systems, New York: Oxford University Press
- Caloz, R. y Collet, C. (2011): Analyse spatiale de l'information géographieque, Lausanne : Presses Polytechniques et universitaires romandes.
- Gómez Delgado, M. y Barredo Cano, J.I. (2005): Sistemas de información geográfica y evaluación multicriterio en la ordenación del territorio, Ra-Ma, Madrid, 2ª edición actualizada

- Lloyd, C.D. (2010) : Spatial data analysis. An introduction for GIS Users. Oxford University Press
- Peña Llopis, J. (2006): Sistemas de información geográfica aplicados a la gestión del territorio, Universidad de Alicante, Alicante
- Quirós Hernández, Manuel (2011): Tecnologías de la información geográfica (TIG) : cartografía, fotointerpretación, teledetección y SIG. Salamanca : Universidad de Salamanca
- Santos Preciado, J.M. (2008): Los sistemas de información geográfica vectoriales : el funcionamiento de ArcGis, Madrid : Universidad Nacional de Educación a Distancia