

**COURSE DATA****Data Subject**

<b>Code</b>	33805
<b>Name</b>	Geographical Information Systems II
<b>Cycle</b>	Grade
<b>ECTS Credits</b>	6.0
<b>Academic year</b>	2022 - 2023

**Study (s)**

<b>Degree</b>	<b>Center</b>	<b>Acad. year</b>	<b>Period</b>
1318 - Degree in Geography and the Environment	Faculty of Geography and History	3	First term

**Subject-matter**

<b>Degree</b>	<b>Subject-matter</b>	<b>Character</b>
1318 - Degree in Geography and the Environment	626 - Geographic information systems II	Obligatory

**Coordination**

<b>Name</b>	<b>Department</b>
SALOM CARRASCO, JULIA	195 - Geography

**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

## OUTCOMES

### 1318 - Degree in Geography and the Environment

- Have oral and written communication skills in one's own language and in a foreign language.
- Have computer skills related to the field of study.
- Be able to work independently.
- Be able to work in interdisciplinary teams.
- Show motivation for quality, responsibility and intellectual honesty.
- Be able to produce statistical information. Know how to use statistical software.
- Have research skills.
- Learn about geographic information systems.
- Get acquainted with geographic information systems as a tool for learning about and interpreting the territory and the environment.
- Be able to relate and synthesise cross-disciplinary territorial information.
- Be able to use cartography and geographic information systems.

The course aims to convey the knowledge of the theoretical foundations of Geographic Information Systems (GIS) and provide the student with experience in the management of applications and analysis of information. The student, at the end of the course:

1. Will know and will be able to apply the analysis functions of the SIG.
2. Will Know and will be able to apply procedures for processing and analyzing information.
3. Will know how to use GIS for the resolution of territorial problems
4. Will be able to integrate the use of GIS in the study of the dynamics of the environment.

## DESCRIPTION OF CONTENTS

### 1. Working with tables

- 1.1. Basic commands for working with tables
- 1.2. Entry of tabular data and cartographic representation.
- 1.3. Information selection and management functions
  - 1.3.1. Identification of elements
  - 1.3.2. Selection by attributes
  - 1.3.3. Spatial selection

### 2. Functions of geoprocessing and spatial analysis



- 2.1. Data management functions (Merge, Clip, Dissolve, Add x-y Data)
- 2.2. Overlay functions (Intersect, Union, Spatial Join)
- 2.3. Functions of proximity (Buffer)
- 2.4. Spatial modelling.

### 3. Advanced analysis functions in raster format

- 3.1. Analysis functions of visual impact (Viewshed).
- 3.2. Density functions
- 3.3. Zonal Statistics.
- 3.4. Analysis functions of the distance (Distance)

### 4. Network Analysis in vectorial format

- 4.1. Presentation of the module Network.
- 4.2. Search for optimal routes.
- 4.3. Delimitation of areas of influence
- 4.4. Introduction to Spatial Statistics with GIS

## WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	30,00	100
Computer classroom practice	15,00	100
Other activities	15,00	100
Preparation of evaluation activities	30,00	0
Preparing lectures	15,00	0
Preparation of practical classes and problem	45,00	0
<b>TOTAL</b>	<b>150,00</b>	

## 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)

## 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 géographique*, 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