VNIVERSITAT ID VALÈNCIA

# COURSE DATA

## Data Subject

| Code | 33803 |
|---|---|
| Name | Cartography II |
| Cycle | Grade |
| ECTS Credits | 6.0 |
| Academic year | 2023 - 2024 |

## Study (s)

| Degree | Center | Acad. year | Period |
|---|---|---|---|
| 1318 - Degree in Geography and the Environment | Faculty of Geography and History | 2 | First term |

## Subject-matter

| Degree | Subject-matter | Character |
|---|---|---|
| 1318 - Degree in Geography and the Environment | 624 - Cartography II | Obligatory |

## Coordination

| Name | Department |
|---|---|
| VALERA LOZANO, ANTONIO | 195 - Geography |

# SUMMARY

The course "Cartografia II" focuses on the study (theoretical) and production (practice) of all kinds of thematic maps. This is the first course where students become familiar with geographic information systems. The aim of this course is that students learn to interpret and make the most common types of thematic maps using computer tools. To this end they must learn to: - Define the purpose of the map or of the chart to make - Select and process information properly - Select visual variables and the type of graphical representation more appropriate - Use correctly tools to get the appropriate result - Use your critical for detecting and handling errors in their own maps or other existing material

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## PREVIOUS KNOWLEDGE

### Relationship to other subjects of the same degree

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

### Other requirements

The course Cartografia I should be passed. Having some skills on using computer programs.

### 1318 - Degree in Geography and the Environment

- Comunicación oral y escrita en la lengua propia y conocimiento de una lengua extranjera.

- Conocimientos de informática relativos al ámbito de estudio.

- Capacidad de trabajo individual.

- Capacidad de trabajo en equipos de carácter interdisciplinar.

- Motivación por la calidad en el trabajo, responsabilidad, honestidad intelectual.

- Habilidades de investigación.

- Métodos de información geográfica.

- Técnicas de información geográfica como instrumento de conocimiento e interpretación del territorio y del medio ambiente.

- Relación y síntesis información territorial transversal.

- Manejo de la cartografía y los sistemas de información geográfica.

- Elaborar e interpretar información estadística. Manejo de programas estadísticos.

In this course, students will learn and understand the language of maps. They will learn both photointerpretation and interpretation of different types of thematic maps. These kind of maps will be essential in their academic and professional development. Moreover, in this course students will use digital sources of information and tools from which will help them into some other courses such as GIS I and GIS II.

## DESCRIPTION OF CONTENTS

### 1. Aerial photography and image interpretation

1.1. Properties of aerial photos: Typologies; Scale, displacement, deformation and parallax; Orthorrectification. 1.2. Image interpretation and validation. Image interpretation criteria: Hue, texture, spatial location and other criteria; Image interpretation and validation process. From more than 100 years, aerial photography has been the main source of information in cartography. Image interpretation is the technique applied to extract thematic data by using visual analysis of aerial photographs.

## 2. Concept of Thematic Maps

A thematic map is the one that is designed to show particular features or concepts, using as a base a map support. 2.1. Relevance to geography and to other sciences It is therefore an essential tool for geography, but also for other sciences that can use spatial analysis to study, such as engineering and economy. 2.2. Applications Thematic mapping applications are varied in Geography or in Engineering. They are used especially for land management (planning, natural resources and environment), and thematic maps can be as diverse as realities are representable (roads, settlements, population density, land use, network river elevations, etc.). 2.3. Geographic information The data must be treated in order to remove unnecessary data and, if necessary, should be converted into indexes, densities, percentages, etc. in order to carry out the map. 2.4. Information Data can be absolute or relative. Absolute data are data such as consumption of goods, population, altitude, rainfall... Relative data express some kind of relationship between two or more datasets: population density, per capita income, unemployment rate...

## 3. Tools for the development of thematic cartography

3.1. CAD (Computer Aided Design): These systems were built to design and draw new objects. They represent objects in 2D and 3D, widely used for people working in design and representation such as engineers, architects, draftsmen, etc. 3.2. GIS (Geographic Information System): These systems relate datasets through its geographic location in order to meet spatial requirements. 3.3. Sources and map resources on the Internet: Spatial Data Infrastructure (IDEs) and Open Data; download services, data catalogues and geographic data viewers.

## 4. Graphic Semiology

4.1. Cartographic language. It tries to improve the expressiveness of the graphical features of elements in a map in order to optimize the visualization process that transfers information from the map to the consultant. 4.2. Visual variables: strengths and limitations. The map is a graphical tool that plays through three primary elements (point, line, plane) whose visual variables may be modified by the cartographer to make distinctions. These variables are size, value, texture, color, orientation and shape.

## 5. Types of maps

The maps can be made out of points, lines or surfaces. From these three primary elements different types of thematic maps can be defined such as proportional symbols maps, dot maps, isoline maps, coroplethes, flow maps, etc.

## 6. Place names and labelling

Geographic names and concept of toponymy. Maps labelling: location, typography and size. Geographic names and labelling are very important in the graphic representation of a map. Graphic and thematic quality of a map depends mostly of the selection, style and placement of place names or labels.

## 7. Specialized thematic maps

Cartography and urban planning. Land use maps help to plan the land.

## WORKLOAD

| ACTIVITY | Hours | % To be attended |
|---|---|---|
| Theory classes | 30,00 | 100 |
| Computer classroom practice | 15,00 | 100 |
| Other activities | 15,00 | 100 |
| Development of individual work | 30,00 | 0 |
| Study and independent work | 30,00 | 0 |
| Preparing lectures | 15,00 | 0 |
| Preparation of practical classes and problem | 15,00 | 0 |
| TOTAL | 150,00 | |

## TEACHING METHODOLOGY

Theoretical lectures will be held during the first days of the course. Practical lectures will be held during the middle and end of the course and will include preparation of thematic maps using ArcGIS software. Exercises, whose completion can be done outside of class, will be made whenever possible in  coordination with other courses. These exercises, along with their interpretation (comment) must be included in a practical  notebook that will be an essential part of the evaluation.

## EVALUATION

The evaluation system will not reside solely in the assessment of the exam tests, but I will constitute a continuous procedure throughout the semester. The final qualification will combine the evaluation of the supervised work – which includes exercises and course practices – and the results of the complementary activities, which include seminars, field trips, conferences, written tests or exams, and others.

The evaluation will be adjusted to these percentages:

Theoretical and practical exam: 60%

Practical work: 30%

Complementary activities: 10%

Qualification system will held de Normative of the Universitat de València, approved by Consell de Govern 27th January of 2004. (RR.DD. 1044/2003 and 1125/2003)

## REFERENCES

### Basic

- BERNABÉ, M.A. Y LÓPEZ, C.M. (2012): Fundamentos de las Infraestructuras de Datos Espaciales. Madrid, Universidad Politécnica de Madrid. Disponible en: http://redgeomatica.rediris.es/Libro_Fundamento_IDE_con_pastas.pdf

- BORDEN, D. (1993): Cartography: thematic map design, Dubuque (IA) : WCB Wm. C. Brown

- CARRERA, C. ET AL. (1988): Trabajos prácticos en geografía humana, Madrid, Síntesis

- CUFF, D. J. (1984): Thematic maps: their design and production, New York, Methuen

- FIELD, K. (2018): Cartography. A compendium of design thinking for mapmakers. Redlands, Esri Press.

- MORENO JIMENEZ, A. (coord.) (2005): Sistemas y análisis de la información geográfica. Manual de autoaprendizaje con ArcGIS.2da edición. Madrid, Ra-ma.

- ORMELING, F. Y RYSTEDT, B. (2017): El mundo de los Mapas. Viena, International Cartographic Association (ICA). Disponible en: https://mapyear.icaci.org/el-mundo-de-los-mapas/index.html

- SANTOS PRECIADO, J.M. (2004): Sistemas de Información Geográfica. Madrid. UNED.

### Additional

- KEATES, J.S. (1989): Cartographic design and production, Harlow, Longman

- ROBINSON, A. (1987): Elementos de Cartografía. Omega, Barcelona

- MONMONIER, Mark S. (1991): How to lie with maps. Chicago, The University of Chicago Press