

## 25235 - Applied and thematic cartography

### Información del Plan Docente

Academic Year	2017/18
Faculty / School	201 - Escuela Politécnica Superior
Degree	277 - Degree in Environmental Sciences
ECTS	6.0
Year	
Semester	Four-month period
Subject Type	Optional
Module	---

### **1.General information**

#### **1.1.Introduction**

#### **1.2.Recommendations to take this course**

#### **1.3.Context and importance of this course in the degree**

#### **1.4.Activities and key dates**

### **2.Learning goals**

#### **2.1.Learning goals**

#### **2.2.Importance of learning goals**

### **3.Aims of the course and competences**

#### **3.1.Aims of the course**

#### **3.2.Competences**

### **4.Assessment (1st and 2nd call)**

#### **4.1.Assessment tasks (description of tasks, marking system and assessment criteria)**

### **5.Methodology, learning tasks, syllabus and resources**

#### **5.1.Methodological overview**

The learning programme of this subject is based on the following distribution:

##### **Lectures.**

Teaching Methodology: Interactive exposition.

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### Practical classes and seminars

Teaching Methodology: Cooperative working sessions. Use of Geographic Information System Software (QGIS and ArcGIS). Development of environmental maps in order to solve problems using orthoimages and stereoscopic images. The data is integrated in reference layers using QGIS and ArcGIS.

### Fieltrips

Teaching Methodology: individual and group tasks during fieldwork. Data acquisition in the field. Mapping of landforms and edafological, biological and geographical data.

### 5.2.Learning tasks

The following activities are conducted to improve the environmental knowledge of the students and reach the fundamental mapping skills.

On-site activities:

Lectures are given following an interactive exposition of the theoretical contents. At the end of every unit, the teacher will propose further reading/writing related with the explained content in order to solve environmental problems. The solution to those problems will be discussed and defended at the end of the lectures. The teacher may provide short-answer tests throughout the lectures so as to determine the comprehension level and knowledge of the students.

Practical classes will be carried out in the computer room. Every student will use Geographic Information System Softwares (GIS) in order to implement geographic, geological, biological and land use data into reference layers. At the end of every class, the students are asked to send the teacher a shorth report by email.

Personal working activities:

This activities are thought to understand, learn and study the theoretical contents explained during the lectures with complete time flexibility.

Lectures and computer sessions: This subject is based on computer working at class and at home in order to learn the subject contents and be skillfull in the management of GIS softwares. The students will need 1 hr per session to carry out the practical report. This must be clean and well-presented and should include the methodology and the results.

Exams: The student will need a minimum of 15 hr to review the contents of the subject. The exam is divided into two parts. In the first one, the students have to recognise and describe environmental maps that were seen and discussed during the lectures and practical sessions. The second part, the student has to elaborate a map using GIS and discuss its usefulness.

### 5.3.Syllabus

#### Lectures

1. Introduction to applied mapping: definition and features of different scientific maps. Database for assessing and managing environmental issues.
2. Development and design of scientific maps.
3. Environmental maps, geological hazard maps and usefulness in exploitation and development plans.
4. Mapping techniques. Aerial and satellites images and their interpretation. The temporal factor in the interpretation of the landscape and environmental processes.

#### Computer sessions

- 1.- Geographic and environmental database information. WMS servers from GIS.
- 2.- Map pieces and composition. Working in the layout screen. Basic elements (North, scale, title, size and type of fonts...).
- 3.- Design and development of scientific and derived maps from Digital Elevation Models (DEM) and geographic data using GIS.
- 4.- Evaluating the utility and quality of the design and content of maps.
- 5.- Stereoscopic and orthoimages. Basic mapping.

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6.- Mapping of geomorphological landforms.

7.- Environmental, geological hazards and development planning maps.

Fieldtrip:

Tena Valley. Development of landslide maps in the field and its utility. The case of the Formigal Ski Resort.

### 5.4.Course planning and calendar

Type of activity / week	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Total	
On-site activities																						60
Lectures	1																					5
Seminars	2	2	2	2	2	2			2	2	2	2	2	1								25
Laboratory sessions																						0
Group report	1	2	2	2	2	2			2	2	2	2	2	3	2							24
Fieldtrip						6																6
Tutorials																						0
Exams																						0
Personal activities																						90
Personal studying	1,5	2		1,5	2		4	4,0	2	2	2	2	2	2,5	4	4	4	3				46,5
Group work	2	2,5	2	2	2		4	4,0	2	2	2	2	2	1,0	2	4	4	2				44
<b>TOTAL</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>10</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>5</b>			<b>150</b>

### 5.5.Bibliography and recommended resources

**BB** Cartografía geomorfológica básica y aplicada / José Luis Peña Monné, editor ; [José Luis Peña Monné ... (et al.)] . 1a ed. Logroño : Geoforma, 1997

**BB** Geomorfología práctica : ejercicios de fotointerpretación y planificación geoambiental / Juan de Dios Centeno ... [et al.] . Madrid : Rueda, D.L. 1994

**BB** Sistemas y análisis de la información geográfica : manual de autoaprendizaje con ArcGIS / Coordinador Antonio Moreno

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- BB Jiménez; autores Rosa Cañada Torrecillas ... [et al.] . Madrid : Ra-Ma, 2006  
Thematic cartography and geovisualization / Terry A. Slocum ... [et al.] . 3rd ed. Upper Saddle River, NJ : Pearson Prentice Hall, cop. 2009
- BC Bernhardsen, Tor. Geographic information systems : an introduction / Tor Bernhardsen . 3rd ed. New York : John Wiley & Sons, cop. 2002
- BC Bertin, Jacques. Semiologie graphique : les diagrammes, les réseaux, les cartes / par Jacques Bertin avec la collaboration de Marc Barbut...[et al.] Paris : Mouton : Gauthier-Villars, 1967
- BC Elementos de cartografía/ Arthur H. Robinson...[et al.]; [traducción por Rosa Ma Ferrer] . ed. española/ revisada por Josep M. Rabella i Vives, Josep M. Panareda i Clopés Barcelona : Omega, D.L. 1987
- BC Gutiérrez Elorza, Mateo. Geomorfología / Mateo Gutiérrez Elorza . Madrid [etc.] : Pearson Educación, 2008
- BC International classification and mapping of vegetation = Classification internationale et cartographie de la végétation = Clasificación internacional y cartografía de la vegetación . Paris : Unesco, 1973
- BC Joly, Fernand. La cartografía / Fernand Joly ; [traducción de D. Bas] . [1a. ed. en lengua castellana] Vilassar de Mar, Barcelona : Oikos-Tau, 1988
- BC Keys to soil taxonomy / by Soil Survey Staff . [9th ed], reimp. [Washington, D.C.] : U.S. Dept. of Agriculture, Natural Resources Conservation Service, 2003 (reimp. 2005)
- BC Martínez-Torres, Luis Miguel. Principales tipos de mapas geóticos : (guías de mapas temáticos para el análisis del medio físico) / L. M. Martínez-Torres . Bilbao : Universidad del País Vasco, 1995
- BC Tarbuck, Edward J.. Ciencias de la tierra : una introducción a la geología física / Edward J. Tarbuck, Frederick K. Lutgens ; ilustrado por, Dennis Tasa; traducción AMR Traducciones científicas; revisión técnica y adaptación, Manuel Pozo Rodríguez, José Manuel González Casado . 8ª ed. Madrid : Prentice Hall, D.L. 2005



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