

Academic Year/course: 2022/23

## 26431 - Geomorphological and Geoenvironmental Mapping

### Syllabus Information

**Academic Year:** 2022/23

**Subject:** 26431 - Geomorphological and Geoenvironmental Mapping

**Faculty / School:** 100 - Facultad de Ciencias

**Degree:** 296 - Degree in Geology  
588 - Degree in Geology

**ECTS:** 5.0

**Year:** 4

**Semester:** Second semester

**Subject Type:** Optional

**Module:**

## 1. General information

### 1.1. Aims of the course

The learning objectives aim to establish the conceptual and methodological bases for the elaboration of geomorphological maps and the derivation of cartographic documents of interest in territorial planning and management. Special attention is paid to the characterisation of Quaternary surface formations, the assessment of active processes and the differentiation of homogeneous geomorphological units.

### 1.2. Context and importance of this course in the degree

This is an optional subject of a practical nature that complements previously taken compulsory subjects. It is especially related to Geomorphology, Geological Risks and Environmental Geology.

### 1.3. Recommendations to take this course

- Have basic knowledge of geomorphology.
- Have a minimum of experience in the use of photogeological reconnaissance techniques using stereoscopic aerial photograph pairs.
- Attend classes given the practical nature of the teaching.
- Work in a continuous and progressive manner from the beginning.
- Make use of academic tutorials.

## 2. Learning goals

### 2.1. Competences

The learning objectives will make it possible to:

- Recognise erosional and cumulative landforms corresponding to different morphogenetic systems.
- Chronologically order the component elements of modelling
- Identify functional geomorphological processes
- Establish homogeneous morphodynamic units
- Describe surface formations, with special emphasis on their basic geotechnical characteristics and their possible use as a source of resources.
- use standardised geomorphological mapping systems
- Represent geomorphological and geo-environmental information using geographic information systems (ArcGIS).
- Derive regional cartographic documents of applied interest in environmental planning and spatial planning.
- Manage the available regional and thematic geomorphological bibliographic references.
- Prepare a geomorphological mapping report following a standardised scheme of scientific works/reports

### 2.2. Learning goals

The learning objectives will:

- Identify, recognise and order chronologically, both in aerial images with stereoscopic vision and in the field, the basic erosive and cumulative morphologies (surface formations) of a working area and interpret the genetic processes that form them.

- Basic use of geographic information systems (ArcGIS) in spatial data management and representation of cartographic documents.
- Develop basic and applied geomorphological cartographies of interest in environmental planning and land use planning.
- Synthesise available thematic and regional information and produce geomorphological reports, documents and presentations.
- Integrate and apply the knowledge acquired in different disciplines of the degree course.

### 2.3. Importance of learning goals

Geomorphological and geo-environmental mapping is a basic tool applied in Environmental Planning and Spatial Planning on a regional scale. It considers the actions to be developed, the characteristics of the physical environment and the interactions derived in terms of risk/impact.

## 3. Assessment (1st and 2nd call)

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

The assessment of the learning objectives foreseen in the case of classroom development of the subject is carried out by means of:

- Continuous assessment of the students during the development of the planned teaching activities of cabinet and field. Continuous assessment represents 25% of the final mark.
- Assessment of the final report on an area of work designated by the lecturer. This report will consist of a scientific report and geomorphological cartographies, homogeneous units, active processes and carrying capacity. The final report represents 75% of the final mark. This is broken down in such a way that the report will be 75% and the cartographies 25%. Of this 25% corresponding to the cartography, each map will represent 25% of the final mark in this section.

Non-attendance students will be assessed on the basis of the following activities:

- Using geographic information systems and orthophotos and digital terrain models of a given area it is necessary to represent, following standardised methods, the recognised erosive and cumulative terrain morphologies, the identified active processes and the differentiated homogeneous geomorphological units.
- a written report on the geomorphological evolution of the area in question, definition of the geomorphological constraints of land use and characterisation of the established homogeneous geomorphological units.

The two activities of the overall test must be passed independently. Both activities (a and b) constitute 50 % of the mark respectively.

In either of the two cases the grading system will be expressed by means of a numerical grade in accordance with the provisions of art.5 of Royal Decree 1125/2003 of 5 September (BOE 18 September), which establishes the European credit system and the grading system for official university degrees valid throughout the national territory (0-4.9 = Fail; 5.0-6.9 = Pass; 7.0-8.9 = Good; 9.0-10 = Outstanding)

## 4. Methodology, learning tasks, syllabus and resources

### 4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. It favors the production of geomorphological and geoenvironmental mapping. A wide range of teaching and learning tasks are implemented, such as practice sessions, fieldwork and autonomous work and study.

Students are expected to participate actively in the class throughout the semester.

Classroom materials will be available via Moodle. These include the course syllabus, a repository of complementary mapping information and aerial photographs used in class, as well as other course-specific learning materials.

Further information regarding the course will be provided on the first day of class.

### 4.2. Learning tasks

This is a 5 ECTS course organized as follows:

- **Practice sessions** (4 ECTS: 40 hours). Three-hour sessions that take place every week in room 7 (Building C) aimed to produce geomorphological, active processes and homogeneous land units mapping documents. Students are provided in advance with task guidelines for each session.
- **Fieldwork** (1 ECTS: 10 hours). Five-hour sessions that take place on the field aimed to i) the recognizance of the local landscape including both erosive and accumulative landforms, ii) the description of surficial geological deposits and iii) the identification of active geomorphic processes. Students are provided in advance with task guidelines for each session.
  - Selected study area is located in the Iberian Range, Ebro Basin or Pyrenees.

Teaching and assessment activities will be carried out on site for as long and as much as possible. This scenario could change if safety regulations related to the covid19 crisis recommended online activities.

### 4.3. Syllabus

The course will address the following topics:

#### Practice sessions

- Topic 1. Geomorphological mapping
- Topic 2. Geomorphic processes mapping
- Topic 3. Homogeneous geomorphic land units mapping
- Topic 4. Introduction to ArcGIS software use

#### Field work

- Topic 5. Geomorphological field work in the study area

### 4.4. Course planning and calendar

Provisional course planning:

- Topic 1 will be studied from week 1 to 5.
- Topic 2: week 6.
- Topic 3: week 7.
- Topic 4: week 8 to 10.
- Topic 5: trips 1 and 2.

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class or please refer to the Faculty of Sciences and Earth Sciences Department websites (<https://ciencias.unizar.es>, <https://cienciatierra.unizar.es>) and Moodle.

### 4.5. Bibliography and recommended resources

[http://biblos.unizar.es/br/br\\_citas.php?codigo=26431&year=2020](http://biblos.unizar.es/br/br_citas.php?codigo=26431&year=2020)