

## 28302 - Geomorphology

### Información del Plan Docente

Academic Year	2018/19
Subject	28302 - Geomorphology
Faculty / School	103 - Facultad de Filosofía y Letras
Degree	419 - Degree in Geography and Land Management
ECTS	6.0
Year	1
Semester	First semester
Subject Type	Basic Education
Module	

### **1.General information**

#### **1.1.Aims of the course**

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

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

### **2.Learning goals**

#### **2.1.Competences**

#### **2.2.Learning goals**

#### **2.3.Importance of learning goals**

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

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

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

#### **4.1.Methodological overview**

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, practical exercises, individual and group tasks, guided tasks, field work, 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 a repository of the lecture notes used in class, the course syllabus, as well as other course-specific learning materials.

## 4.2. Learning tasks

The course includes the following learning tasks:

- Lectures (25 hours)
- Individual and/or group tasks (40 hours)
- Laboratory sessions (10 hours)
- Field work (10 hours)
- Guided tasks (32 hours)

## 4.3. Syllabus

The course will address the following topics:

### **SECTION 1. RELIEF AND GEOMORPHOLOGY: Introduction. The landforms, a geographical study. Geomorphic systems. People as creators of landforms.**

- Topic 1. Geomorphology, the science of landforms. History of Geomorphology.
  - The approach to Geomorphology until the nineteenth century. Description of the environment. Background of modern geomorphology.
  - The study of the landforms from the nineteenth century. The knowledge of landforms. Structural and Climatic Geomorphology.
  - Geomorphology from the twentieth century: Dynamic Geomorphology, Applied Geomorphology, Environmental Geomorphology.

### **SECTION 2. GEOLOGICAL CHARACTERISTICS OF THE LANDFORMS**

- Topic 2. Earth and the geodynamics.
  - The Earth as a planet in the Universe.
  - The internal structure of the Earth.
  - Plate Tectonics, Geodynamic and Orogens. Evolution of the major structural Topics: geological time.
  - Continental and oceanic topography.
- Topic 3. The Earth rocks.
  - Minerals and rocks.
  - Classification of the rocks: sedimentary, igneous and metamorphic rocks.
  - Rocks and landforms.
- Topic 4. The deformations of the earth's crust: tectonic and landforms.
  - Geological structures: folds and faults.

### **SECTION 3. THE STRUCTURAL RELIEF**

- Topic 5. Tectonic and structural landforms.
- Topic 6. Lithology and landforms (karstic landforms, volcanic landforms...).

### **SECTION 4. THE MODELING OF LANDFORMS**

- Topic 7. Weathering
  - Weathering: concept and factors that control weathering.
  - Mechanical Weathering: fragmentation and disaggregation.
  - Chemical weathering: oxidation, hydration, dissolution, hydrolysis.
  - Organic Weathering: soil formation.
  - Development of modeling: Quantitative analysis of the form of erosion on the Earth's surface.
- Topic 8. Slope processes
  - Gravity and overland flow.
  - Mass movements.
  - Slopes and morphometry.

## 28302 - Geomorphology

- Topic 9. Fluvial processes and river valleys
  - o Drainage basin landforms.
  - o Fluvial dynamics: Fluid flow in channels, sediment transport and discharge of water and sediment.
  - o Fluvial landforms: erosion and sedimentation landforms.
  - o River valleys.
  - o Floodplains and terraces. Alluvial fans.

### SECTION 5. THE GREAT LAND TYPES OF MODELING

- Topic 10. The relief and climate: Climatic Geomorphology.
  - o Relations between topography, climate and vegetation cover. Morphoclimatic systems.
  - o Quaternary processes and landforms.
  - o Morphoclimatic Earth diversity.
- Topic 11. Glacial and periglacial processes and landforms.
  - o Glaciers. Spatial distribution of glaciers along the Quaternary.
  - o Processes and mechanisms: flow and glacial activity.
  - o Glacial landforms.
  - o Proglacial and Periglacial activity.
- Topic 12. Eolian processes and landforms.
  - o Eolian activity: spatial distribution.
  - o Eolian processes and landforms: forms of erosion and sedimentation.
- Topic 13. The coastal processes and landforms
  - o Quaternary variations of sea level.
  - o Coastal factors and processes: tides, waves, currents, storms, tsunamis.
  - o Coastal landforms: depositional and erosional landforms.
  - o Deltas and estuaries.

### 4.4.Course planning and calendar

The course is divided into 5 sections. The first section includes the following topics: Introduction and Topic 1; it runs during the first 2 weeks of the semester. The second section includes the topics 2, 3, 4 and 5 -geological characteristics of the landforms- and runs during the following three weeks. The third section covers the topics 6 and 7 -lithological and tectonic landforms- and develops during three weeks. The fourth section covers the topics 8, 9 and 10 -weathering- and runs during the following four weeks, and the last section covers the four final topics, 11, 12, 13, 14 -climatic landforms- and runs during the last three weeks.

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 "Facultad de Filosofía y Letras" website (<https://fyl.unizar.es/horario-de-clases#overlay-context=horario-de-clases>)

### 4.5.Bibliography and recommended resources

- BIROT, P (1981): *Les processus d'érosion à la surface des continents*. Edit. Masson. Paris.
- BUDEL, J. (1988): *Climatic Geomorphology*. Princeton University Press.
- CHORLEY, R.J., SCHUMM, S.A. & SUGDEN, D.E. (1984): *Geomorphology*. Methuen. Londres.
- COQUE, R. (1984): *Geomorfología*. Alianza Universidad Textos. Alianza Editorial. Madrid. 475 pp.
- DEMEK, J. (Ed.) (1972): *Manual of detailed geomorphological mapping*. IGU Comm. Geomorph. Survey Mapping Czech. Sci. Academia Prague. 341 pp.
- DERBYSHIRE, E. (1976): *Geomorphology and Climate*. Wiley. London.
- DERBYSHIRE, E. et al. (1981): *Geomorphological processes*. Butterworths. London.
- DERRUAU, M. (1978): *Geomorfología*. Editorial Ariel. Barcelona. 528 pp.
- EMBLETON, C. & THORNES, J.B. (1979): *Process in Geomorphology*. Edward Arnold. London. 436 pp.
- FAIRBRIDGE, R.W. (Edit.) (1968): *The Encyclopedia of Geomorphology*. Reinhold Book Corporation. New York. 1295 pp.
- GERRARD, A.J. (1981): *The origin of landscapes*. Longman. London
- GERRARD, A.J. (1988): *Rocks and Landforms*. Unwin. London.

## 28302 - Geomorphology

- GUTIÉRREZ ELORZA, M. (2001): *Geomorfología Climática*. Omega. Barcelona, 642 pp.
- GUTIÉRREZ ELORZA, M. (2008): *Geomorfología*. Pearson. Madrid. 898 pp.
- HUGGET, R. (2007): *Fundamentals of Geomorphology*. Routledge. Taylors and Francis Group. 488 pp.
- KING, C.A.M. (1976): *Landforms and Geomorphology*. New York.
- MARTINEZ DE PISON, E. (1985): *El relieve de la Tierra*. Salvat. Barcelona.
- MARTINEZ DE PISON, E. y TELLO, B. (Eds.)(1986): *Atlas de Geomorfología*. Alianza Editorial. Madrid.
- MUÑOZ JIMENEZ, J. (1992): *Geomorfología General*. Editorial Síntesis. Espacios y Sociedades, 4. 351 pp.
- PANIZZA, M. (1990): *Geomorfología Applicata*. NIS. Roma. 342 pp.
- PEDRAZA, J. (1996): *Geomorfología. Principios, Métodos y Aplicaciones*. Edit. Rueda. Madrid. 414 p.
- RICE, R.J. (1982): *Fundamentos de Geomorfología*. Editorial Paraninfo. Madrid. 378 pp.
- SELBY, M.J. (1985): *Earth's changing surface*. Clarendon. Oxford.
- SELBY, M.J. (1993): *Hillslopes Materials and Processes*. Oxford University Press, 451 pp.
- SUMMERFIELD, M.A. (1991): *Global Geomorphology*. Longman. New York.
- THORNES, J. & BRUNDSSEN, D. (1977): *Geomorphology and Time*. Methuen. London. 208 pp.
- TRICART, J. (1965): *Principes et méthodes de la Géomorphologie*. Masson. Paris. 496 pp.
- TRICART, J. (1968-1981): *Précis de Géomorphologie* (3 tomos). SEDES. Paris.
- TRICART, J. (1978): *Geomorphologie Applicable*. Masson. Paris. 204 pp.
- TRICART, J. et CAILLEUX, A. (1965): *Traité de Géomorphologie*. T.I: Introduction a la Geomorphologie climatique. Paris. SEDES. 306 pp.
- TWIDALE, C.R. (1971): *Structural Landforms*. MIT Press. Cambridge.
- TWIDALE, C.R. (1976): *Analysis of Landforms*. Wiley. Singapur.
- VIERS, G. (1973): *Geomorfología*. Elementos de geografía. Oikos-tau. Barcelona. 320 pp.
- YOUNG, A. (1972): *Slopes*. Oliver and Boyd. Edinburgh, 278 pp.