

28302 - Geomorphology

Información del Plan Docente

Academic Year	2016/17
Academic center	103 - Facultad de Filosofía y Letras
Degree	419 - Degree in Geography and Land Management
ECTS	6.0
Course	1
Period	First semester
Subject Type	Basic Education
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The learning and teaching methodology developed in the course is aimed to promote the attainment of its objectives. A wide range of teaching and learning activities is implemented, such as interactive lessons, practical exercises, individual or group activities, directed activities, field work and private study.

A high level of student participation will be required from all students throughout the course.

Extensive material will be available *via* the Moodle site of the course. This offers a variety of resources including a

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repository of the lecture notes used in class, a course syllabus as well as other forms of course-specific materials, including a discussion forum.

5.2.Learning activities

Lecture sessions: 25 hours

Interactive, individual or group activities : 40 hours

Laboratory sessions: 10 hours

Field work: 10 hours

Directed activities: 32 hours

5.3.Program

PART ONE: RELIEF AND GEOMORPHOLOGY

Introduction. The landforms, a geographical study. Geomorphic systems. People as creators of landforms.

Unit 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 twenty century: Dynamic Geomorphology, Applied Geomorphology, Environmental Geomorphology.

PART TWO: GEOLOGICAL CHARACTERISTICS OF THE LANDFORMS

Unit 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 units: geological time.
- Continental and oceanic topography.

Unit 3. The Earth rocks.

- Minerals and rocks.
- Classification of the rocks: sedimentary, igneous and metamorphic rocks.
- Rocks and landforms.

Unit 4. The deformations of the earth's crust: tectonic and landforms.

- Geological structures: folds and faults.

PART THREE: THE STRUCTURAL RELIEF

Unit 5. Tectonic and structural landforms.

Unit 6. Lithology and landforms (karstic landforms, volcanic landforms...).

PART FOUR: THE MODELING OF LANDFORMS

Unit 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.

Unit 8. Slope processes

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- Gravity and overland flow.
- Mass movements.
- Slopes and morphometry.

Unit 9. Fluvial processes and river valleys

- Drainage basin landforms

- Fluvial dynamics: Fluid flow in channels, sediment transport and discharge of water and sediment.

- Fluvial landforms: erosion and sedimentation landforms.

- River valleys

- Floodplains and terraces. Alluvial fans.

PART FIVE: THE GREAT LAND TYPES OF MODELING

Unit 10. The relief and climate: Climatic Geomorphology.

- Relations between topography, climate and vegetation cover. Morphoclimatic systems.
- Quaternary processes and landforms
- Morphoclimatic Earth diversity.

Unit 11. Glacial and periglacial processes and landforms.

- Glaciers. Spatial distribution of glaciers along the Quaternary

- Processes and mechanisms: flow and glacial activity.
- Glacial landforms

- Proglacial and Periglacial activity.

Unit 12. Eolian processes and landforms.

- Eolian activity: spatial distribution.
- Eolian processes and landforms: forms of erosion and sedimentation.

Unit 13. The coastal processes and landforms

- Quaternary variations of sea level.
- Coastal factors and processes: tides, waves, currents, storms, tsunamis.
- Coastal landforms: depositional and erosional landforms

- Deltas and estuaries

5.4.Planning and scheduling

The course is divided into 5 thematic blocks. The first block includes the following units: Introduction and Unit One; it runs

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during the first 2 weeks of the term. The second thematic block includes the units 2, 3, 4 and 5 -geological characteristics of the landforms- and runs during the following three weeks. The third block covers the units 6 and 7 -lithological and tectonic landforms- and develops during three weeks. The fourth block covers the units 8, 9 and 10 -weathering- and runs during the following four weeks, and the last block covers the four last units, 11, 12, 13, 14 -climatic landforms- and runs during the last three weeks.

For further details concerning the timetable, classroom and other information of the course please refer to the

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

5.5. 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.

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.

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- 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): *Geomorfologia 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.