External Geological Processes

Code: 106777
ECTS Credits: 6

2025/2026

Degree	Type	Year
Environmental Sciences	OP	4

Contact

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Teaching groups languages

You can view this information at the end of this document.

Prerequisites

No prerequisites are required to take this course. However, it is convenient that the students review the knowledges on earth science adquired during previous courses of the Degree (e.g. Geology and Hydrology).

Objectives and Contextualisation

This course offers to the student the opportunity to increase knowledge on geomorphology through the study of several practical cases in the lecture room and in the field. Active geological processes characterization is an indispensable part of the land management and geomorphology provides a key basis to understand recent landscape evolution and dynamics. This course gives practical knowledge to facilitate the integration of geo-environmental information in a future professional career. The course has many hours of fieldwork and therefore it has been prepared as a very practical approach to the topic.

Main objectives are:

- To learn about the main external geological processes that shape present day landscape (see contents for more details).

- To learn basic principles on geomorphology and cartography of active geological processes

- To be able to identify in the field the main morphodynamics occurring on our territory.

- To be able to identify main geological risks based on the dominant geological processes occurring on a territory.

- To acquire experience on how to search and analyze information from different available sources (maps, public databases, scientific papers, reports) to integrate it in studies or management plans.

Learning Outcomes

1. CM37 (Competence) Present proposals for the prevention and mitigation of the impact on the physical environment of natural or anthropogenic action, including that based on green chemistry.

2. CM39 (Competence) Transmit general scientific information associated with an environmental problem to a general audience appropriately.
3. KM46 (Knowledge) Identify the most important chemical and geological processes in the different environmental compartments (hydrosphere, soil and atmosphere).
4. KM47 (Knowledge) Recognise the way in which human activity has an impact on the function of physical vectors (water, soil, oceans, atmosphere) in the natural environment.
5. SM46 (Skill) Characterise the main processes of natural environments (marine, soil, atmosphere), including aspects of physics, chemistry, geology, biology and their interaction.
6. SM47 (Skill) Analyse changes in the physical environment caused by natural or anthropogenic action based on the data available.

Content

The students will acquire an integral vision of active geological processes that occur on our territory and how these interact with human activity and environment. The theoretical concepts will be taught in a natural classroom during the field trip sessions. In these field trips, through the study of specific cases in different places of our territory, the analysis of geological and geoanthropic processes and their implications for various geoenvironmental problems will be addressed.

Geology as a fundamental part of the ecological processes and an essential element for landscape interpretation and territorial/land management. Basic principles. Geological cartography and the new geothematic maps of Catalonia (resources guide). Concept of geological risk. Hazard, vulnerability, return period.

Geomorphological system:

- External geodynamics: Introduction. Processes and landforms.

- Fluvial: Hydrosystem. Erosive and depositional systems. Floodplains. Alluvial fans. Fluvial terraces. Flood risk: case study.

- Karst: Limestone dissolution. Superficial features. Sinkholes. Karstic valleys and springs. Evaporite karst. Risk associated to sinkholes and collapses: case study.

- Landslides: Landslides types. Landslide risk: case study.

- Coastal: Sea level oscillations. Waves, coastal currents and tides. Types of coasts. Beach, lagoon, littoral dunes. Estuary and delta formation. Case study on coastal dynamics of the Catalan shore.

- Glacial and periglacial: Glaciers. Glacial erosion. Erosive processes and resulting landforms. Glacial transport and sedimentation. The periglacial domain. Periglacial shapes. Glacial landscape interpretation: case study.

- Arid and semiarid: Eolic processes and landforms. Weathering mechanisms. Lakes of arid areas and associated landforms.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Fieldwork	30	1.2	CM37, CM39, KM46, KM47, SM46, SM47, CM37

Theoretical sessions (taught in a natural classroom during the field trip sessions)	15	0.6	CM37, KM46, KM47, SM46, CM37
Type: Autonomous			
Autonomous work load	93	3.72	KM46, KM47, SM46, SM47, KM46

- The students have to hand in a report on a study case related with external geological processes and geohazards. The oral presentations of these works will take place during the seminar days (see next point).

- Six entire day sessions are planned that consist in 4-5 fieldtrips (whole day) and 1-2 days seminar days (whole day). The seminar day/s will be destined to the oral presentations of the case studies and to work on data and information gathered from the field. The location and contents of these fieldtrips will be detailed on "Campus Virtual" at the beginning of the semester. For some field sessions transportation with bus from UAB will be provided, for other fieldtrips the students will have to go by public transport or by their own transportation. The students will have to bring their own food/water and adequate field clothes and shoes. Attendance to all field and seminar sessions is required to pass the course. The fieldtrip dates can be checked on the semester schedule.

The proposed methodology can be modified if required to adapt it to the mobility restrictions imposed by Health authorities.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

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Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Exercices and fieldwork	25%	2	0.08	CM37, CM39, KM46, KM47, SM46, SM47
Practical exam in natural environment	25%	2	0.08	CM37, CM39, KM46, KM47, SM46, SM47
Work on a case study (including oral presentation)	50%	8	0.32	CM37, CM39, KM46, KM47, SM46, SM47

Evaluation will be based on:

1. Individual. Theoretical and practical exam to evaluate the Practical exam to evaluate the the synthesis capacity of students on a geo-environmental topic (25%)

2. Group/individual. Practical exercises and work during de fieldtrips (25%).

3. Group/individual. Work on a study case: The treatment of a specific case study on geological risk will be evaluated (25%). The students will give oral presentations on their case and their capacity on discussing the questions made by the professors and other students will be evaluated.

Second-chance exam:

The practical exam an the practical exercises and fieldwork cannot be retaken.

The students who have not attended at least 2/3 of the previous evaluation activities may not be re-evaluated.

The proposed evaluation can be modified if required to adapt it to the mobility restrictions imposed by Health authorities.

Single Assessment:

This subject does not consider a single assessment system.

Bibliography

Geomorfology:

- Ahnert, F. (1996). Introduction to Geomorphology. Arnold, 352 p. London.

- Chorley, R.J., Schumm, S.A. y Sudgen, D.E. (1984). Geomorphology. Methuen, 607 p. London.

- Gutiérrez, M. (2008). Geomorfología. Pearson-Prentice Hall, 920 p. Madrid.

- Selby, M.J. (1985). Earth's Changing Surface. Claredon Press, 607 p. Oxford.

- Strahler, A.N. (1965). Introduction to Physical Geography. Wiley, 643 p. New York.

- Summerfield, M.R. (1991). Global Geomorphology. Longman, 537 p. London.

Geology:

Pozo, M.; González Yélamos, J.: Giner, J. (2003). Geología Práctica. Introducción al reconocimiento de Materiales y Análisis de Mapas. Prentice Hall - Pearson educación. ISBN: 84-205-3908-2.

Software

No specific software is required.

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this link. To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PCAM) Field practices	1	Catalan	second semester	morning-mixed
(TE) Theory	1	Catalan	second semester	morning-mixed