Universitat Autònoma de Barcelona

2019/2020

External Geological Processes

Code: 102841
ECTS Credits: 6

Degree	Type	Year	Semester
2501915 Environmental Sciences	OT	4	0

Contact

Name: Olga Margalef
Email: Olga.Margalef@uab.cat

Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: No
Some groups entirely in Spanish: No

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.

Objectives and Contextualisation

The theoretical framework of this course is the study of field cases to highlight the importance of active geological processes (mainly related to geological risks) in an integral management of the territory.

The course wants to provide to the students practical knowledges to facilitate integration and the use of this type of geoenvironmental information in their future professional experiences.

Main objectives are:

- To learn basical principles on geomorphology and cartography of active geological processes (fluvial, coastal, glacial geomorphology, landslides etc...)

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

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

- To adquire 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.

Competences

- Adequately convey information verbally, written and graphic, including the use of new communication and information technologies.
- Analyze and use information critically.
- Demonstrate adequate knowledge and use the most relevant environmental tools and concepts of biology, geology, chemistry, physics and chemical engineering.
- Demonstrate concern for quality and praxis.
- Demonstrate initiative and adapt to new situations and problems.
- Learn and apply in practice the knowledge acquired and to solve problems.

- Quickly apply the knowledge and skills in the various fields involved in environmental issues, providing innovative proposals.
- Teaming developing personal values regarding social skills and teamwork.
- Work autonomously

Learning Outcomes

1. Adequately convey information verbally, written and graphic, including the use of new communication and information technologies.
2. Analyze and use information critically.
3. Assess changes in geological media by natural or anthropogenic action and their level of degradation, and proposals for prevention and mitigation.
4. Demonstrate concern for quality and praxis.
5. Demonstrate initiative and adapt to new situations and problems.
6. Identify the geological processes in the environmental surroundings and to value properly and originally.
7. Interpret maps and geological sections developed by other authors.
8. Interpret over from different spatial scales in terms of geological risk and planning.
9. Knowing the interactions between the various layers or areas of the planet.
10. Learn and apply in practice the knowledge acquired and to solve problems.
11. Prepare and interpret maps and geological sections.
12. Recognize and interpret the forms of relief, and assess the evolution of the landscape.
13. Teaming developing personal values regarding social skills and teamwork.
14. Work autonomously

Content

The students will adquire an integral vision of active geological processes that occurr on our territory and how these interact with human activity and environment. During the theoretical sessions the following topics will be treated.

Applied geology basics

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, litoral 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.

Methodology

- Theoretical sessions will be given during the classroom assigned hours to treat the topics detailed on the content section. Some of these sessions will take place in a computer classroom to access online resources.

- The students will have to hand in a work on 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 will consist in 4-5 fieldtrips (whole day) and 1-2 days seminar days (whole day). The seminar day/s will be destinated 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 in the "Campus Virtual" at the begining of the semester. For some field sessions common transportation with bus from UAB will be provided, for others the students will have to go by public transport. The students will have to bring their own food/water and adequate field clothes and shoes. Assistence to all field and seminar sessions is required to aprove to pass the course. The fieldtrip dates can be checked on the semester schedule.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Fieldwork	30	1.2	2, 10, 3, 9, 5, 4, 11, 6, 8, 7, 12, 1, 14, 13
Theoretical sessions	15	0.6	2, 10, 3, 9, 5, 4, 11, 6, 8, 7, 12, 1, 14, 13
Type: Autonomous			
Autonomous work load	93	3.72	2, 10, 3, 9, 5, 4, 11, 6, 8, 7, 12, 1, 14, 13

Assessment

Evalutation will be based on:

1. Individual. Theoretical and practical exam to evaluate the contents of the course (50%)

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

3. Group/individual. Work on a study case: The treatment of an 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.

Resit:

The theoretical and practical exam can be retaken during the second call at the end of the semester.

Practical exercices and fieldwork cannot be retaken.

A resit on the study case can be done on a second call, however the oral presentation cannot be retaken.

To ask for a reevaluation the student must have been received a mark in activities that represent at least 2/3 of the global mark during the course.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes

Exercices and fieldwork	25 %	4	0.16	2, 10, 3, 9, 5, 4, 11, 6, 8, 7, 12, 1, 14, 13
Practical and theoretical exam	50 %	4	0.16	2, 10, 3, 11, 6, 8, 7, 12, 1
Work on a case study (including oral presentation)	25 %	4	0.16	2, 10, 3, 5, 4, 11, 6, 8, 7, 12, 1, 13

Bibliography

Geomorphology:

- 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.