Universitat Autònoma de Barcelona

2020/2021

Geological Risk Analysis

Code: 101070
ECTS Credits: 4

Degree	Type	Year	Semester
2500254 Geology	OT	3	0
2500254 Geology	OT	4	0

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

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Use of Languages

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

Prerequisites

No prerequisite is requested.

Objectives and Contextualisation

The objective of this course is to initiate students in the knowledge and analysis of geological hazards, so that they can acquire basic knowledge and skills that allow them to undertake studies related to different types of geological risks.

As specific target, the student is expected to acquire skills in:

-The integration of diverse disciplines in a multidisciplinary work where the geological risks are the center of interest.

-The application of the knowledge acquired to the solution of problems related to geological risks.

-The organization and planning of tasks as well as the development of interpersonal skills that allow you to work as a team.

-Explain in class the work developed as a team.

-Know how to face oral and written tests.

Competences

Geology

- Display understanding of the size of the space and time dimensions of Earth processes, on different scales.
- Draw up and interpret geological maps and other means of depicting geological information (columns, correlation frames, geological cross-sections, etc.)

- Evaluate moral and ethical problems in research and acknowledge the need to follow professional codes of conduct.
- Identify and tackle environmental problems, plan land-use and know the principles of prevention and mitigation of geological risks.
- Process, interpret and present field data using qualitative and quantitative techniques, and suitable computer programmes.
- Process, interpret and present laboratory data using qualitative and quantitative techniques, and suitable computer programmes.
- Recognise geomorphological systems, interpret relief forms and evaluate the evolution of the landscape.
- Use geographical information systems applied to geology.

Learning Outcomes

1. Apply Geochemistry concepts to solve problems of land and water pollution.
2. Create and manage databases and topologies to combine data and obtain 2D or 3D graphic results using GIS for environmental management, risk analysis and inventories of the geological heritage.
3. Evaluate and process laboratory data corresponding to environmental issues.
4. Identify and process the value and the sources of field data with environmental implications.
5. Plan the successive exploration stages for each type of project and the development stages from the perspective of sustainability, to avoid irreparable losses of resources and/or geological heritage.
6. Situate the evolution of geological environments and mitigation and/or remediation proposals within space-time scales.
7. Synthesise and select laboratory data, and process it qualitatively and quantitatively using computer programmes.
8. Undertake professional activity in the field of environmental geology, complying with moral and ethical principles.

Content

-Introduction (basic concepts): susceptibility, hazard and risk. Type and classification. Mitigation, prediction and prevention. Analysis and mapping of geological risks.

-Risks associated with geological materials: subsidence, materials with harmful effects on health.

-Risks derived from internal processes: seismic and volcanic.

-Risks derived from external processes: mass movements, floods.

Methodology

The directed activities will consist of: master class of theory, practical activities in the classroom of cartography and in the computer room and a field trip.

Master class

Theoretical knowledge will be transmitted, mainly, in the classroom through master class, with support of ICT and discussion in a large group. Apart from the selected bibliography, students will have a diversified material for the follow-up of classes. These support materials will be available for students on the virtual campus of the subject and at the libraries. The theoretical knowledge acquired by the students will be evaluated through the written tests.

Practices in the classroom of cartography and computer science

The acquired knowledge will be applied to the practices and simple problems will be solved. Cases of different types of geological risks and their associated cartographies will be interpreted and analyzed. The application of

the GIS will be requested to a map of susceptibility.

Field trip and group work

At the field trip the student must acquire a transversal and systemic knowledge of some of the problems worked on the geological risks: recognition of the process, acquisition and validation of data in the field, cartography associated with the risk analyzed. The tasks will be carried out in a group.

The activities will be supported through tutorials in the classroom and at the teacher's office.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Field trip	7	0.28	5, 8, 7, 2, 4, 6
Master class	15	0.6	5, 1, 8, 7, 2, 6
Practical classes	12	0.48	5, 8, 7, 2, 3, 6
Type: Supervised			
Tutorials and follow-up activities proposed both face-to-face and virtually	9	0.36	5, 1, 8, 7, 2, 4, 3, 6
Type: Autonomous			
Problem solving, draft reports.	29	1.16	5, 8, 7, 2, 4, 3, 6
Study of the subject of examination	25	1	5, 8, 7, 2, 4, 3, 6

Assessment

The assessment is carried out throughout the course on a continuous basis, in group and individually.

-Exam: in this part, the scientific-technical knowledge of the subject obtained by the student, as well as their capacity for analysis and synthesis, and critical reasoning, is evaluated individually. The evaluation of the theoretical contents and part of the practical part of the subject is carried out by means of a minimum of 2 written tests that are carried out throughout the course with a weight of 35% each. The contents will be eliminatory (subsequent tests do not include the contents of the previous ones). The qualification of this part is the average of the two written tests, provided that the marks of each one exceed 4.

-Correction of practical activities in the classroom and in the field (15%): it will correspond to the delivery of the reports of practices resolved during the classroom practices.

-Perform a group work of a practical case of geological risk (15%), chosen by the students at the beginning of the course and validated by the team of teachers.

To pass the course, it is necessary that the average of the tests is approved and that the average of the practical activities and the course work is also approved.

When the mark of the continuous evaluation is less than 5, the final exam can be recovered the partial exams suspended.

The two partial tests that will be made jointly on the agreed date for coordination will be subject to recovery. In order to be able to present itself to the recovery it is necessary that the average mark of the continuous

assessment corresponds to the reports of classroom and field activities; and of the autonomous course work is equal to or greater than 5.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
1st partial exam	35	1.5	0.06	5, 1, 8, 7, 2, 4, 3, 6
2nd partial exam	35	1.5	0.06	5, 7, 2, 4, 3, 6
Reports of laboratory and field practices	15	0	0	5, 8, 7, 2, 4, 3, 6
Self-study training	15	0	0	5, 8, 7, 2, 4, 3, 6

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