

Environmental Risk

Code: 106788
ECTS Credits: 6

2025/2026

| Degree | Type | Year |
|------------------------|------|------|
| Environmental Sciences | OP | 4 |

Contact

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Teachers

Marc Pares Franzl

Teaching groups languages

You can view this information at the [end](#) of this document.

Prerequisites

No prerequisites are required.

Objectives and Contextualisation

The objective of this course is to introduce students to the knowledge and analysis of environmentally-originated risks, enabling them to acquire basic knowledge and skills that will allow them to approach studies related to different types of risks. Various definitions, classifications, and measurements of environmental risks will be addressed, and criteria will be designed to manage these risks and contain them at socially acceptable levels.

Students will explore real-world cases, study and discuss practical examples of risk events and their impacts, and develop and apply risk assessments (including both physical and social aspects, such as risk perception) during the planning, development, and implementation of projects with potential risks. This assessment process should enable informed decision-making regarding the acceptability of risk and the measures to be taken to protect human health or ecosystems, within a framework of risk communication that allows for the exchange of opinions among experts, managers, and the general public.

Learning Outcomes

1. CM44 (Competence) Interpret the social, economic and environmental impact of issues related to demographic flows, global change or management in companies.

2. CM46 (Competence) Contrast the different current and future options for environmental risk management, especially in the context of resource management, human health, and global and climate change.
3. KM57 (Knowledge) Identify the complex network of knowledge necessary to comprehensively address the main contemporary challenges in environmental science.
4. KM59 (Knowledge) Recognise the relationship between health, human activity and environmental factors.
5. KM63 (Knowledge) Identify the tools and concepts that make it possible to assess environmental risks and keep them at socially acceptable levels.

Content

Course Syllabus

BLOCK I - INTRODUCTION TO ENVIRONMENTAL RISK

- Basic concepts: natural disasters and catastrophes; risk, hazard, vulnerability, and exposure; resilience.
- Types of risks: natural, technological, mixed, global, and induced.
- Risks around the world: historical perspective and future scenarios.

BLOCK II - RISK ANALYSIS

- Risks from internal geological processes: seismicity and volcanism.
- Material-related risks: radon gas, CO₂, arsenic and fluoride in groundwater, asbestos. Health impacts.
- Risks from external gravitational geological processes: mass movements, avalanches, and subsidence.
- Flood risks: riverine and coastal. Flooding and climate change.
- Climatic risks: physical phenomena, droughts, and climate change-related alterations.
- Wildfire risks: climate change and sixth-generation wildfires.
- Technological risks: types and scales. SEVESO directive. Industrial accidents.

BLOCK III - RISK MANAGEMENT

- Paradigms and strategies for risk management.
- Risk perception, acceptability, and communication.
- Preventive strategies: mitigation, protection, preparedness, and adaptation.
- Emergency management: civil protection, coordination, and emergency plans.
- Post-disaster management.

Activities and Methodology

| Title | Hours | ECTS | Learning Outcomes |
|----------------------|-------|------|------------------------------------|
| Type: Directed | | | |
| Field activities | 6 | 0.24 | CM46, KM57, KM59, KM63, CM46 |
| Master class | 28 | 1.12 | CM44, CM46, KM57, KM59, KM63, CM44 |
| Practical activities | 14 | 0.56 | CM44, CM46, KM57, KM59, KM63, CM44 |

Type: Supervised

| | | | |
|--|----|-----|------------------------------------|
| Tutorials and monitoring of proposed activities, in-person and virtual | 5 | 0.2 | CM44, CM46, KM57, KM59, KM63, CM44 |
| Type: Autonomous | | | |
| Problem solving, report writing | 25 | 1 | CM44, CM46, KM57, KM59, KM63, CM44 |
| Study of the exam subject | 25 | 1 | CM44, CM46, KM57, KM59, KM63, CM44 |

The directed activities will include: theoretical lectures, problem-solving activities based on practical cases in the classroom and computer lab, and a field trip. Additionally, activities that encourage student participation through seminars and tutorials will be included.

Lectures: Theoretical knowledge will be delivered primarily through lectures in the classroom, supported by ICT tools and large-group discussions. In addition to the selected bibliography, students will have access to a variety of materials to support their learning. These resources will be available on the course's virtual campus and in the university libraries. The theoretical knowledge acquired by students will be assessed through written exams.

Problem-solving activities in the classroom and computer lab: Students will apply the knowledge acquired during lectures to practical exercises and solve simple problems. They will interpret and analyze cases involving different types of environmental risks and their associated cartography. The use of GIS will be required for practical exercises involving susceptibility mapping.

Fieldwork: During the field trip, students will gain a cross-disciplinary and systemic understanding of some of the environmental risk issues covered in the course. This includes recognizing processes, collecting and validating field data, and mapping the analyzed risks.

Some tasks will be carried out in groups to promote cooperative learning. Students will also give oral presentations of their work in class, encouraging debate and active participation.

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.

Assessment

Continuous Assessment Activities

| Title | Weighting | Hours | ECTS | Learning Outcomes |
|---|-----------|-------|------|------------------------------|
| Independent case study work | 15 | 25 | 1 | CM44, CM46, KM57, KM59, KM63 |
| Reports of classroom and field activities | 25 | 20 | 0.8 | CM44, CM46, KM57, KM59, KM63 |
| Student participation in all activities | 10 | 0 | 0 | CM44, CM46, KM57, KM59, KM63 |
| 1st midterm exam | 25 | 1 | 0.04 | CM44, CM46, KM57, KM59, KM63 |
| 2nd midterm exam | 25 | 1 | 0.04 | CM44, CM46, KM57, KM59, KM63 |

Assessment is carried out continuously throughout the course, partly in groups and partly individually.

- Exams: This component individually evaluates the student's scientific and technical knowledge of the subject, as well as their analytical and synthesis skills and critical thinking. The evaluation of theoretical content and part of the practical content is conducted through a minimum of two written tests during the course, each accounting for 25% of the final grade. The content is non-cumulative (later tests do not include material from previous ones). The grade for this section will be the sum of the two written tests, provided that each score is higher than 4.
- Assessment of practical activities in the classroom and in the field (25%): This corresponds to the submission of reports completed during classroom and fieldwork sessions.
- Group project on a practical case of environmental risk (15%), chosen by the students at the beginning of the course and approved by the teaching team.
- Participation in class (10%): This includes participation in lectures, debates, and general activities both in the classroom and in the field.

To pass the course, students must achieve a passing average in the written tests and also in the practical activities and coursework.

If the final grade from continuous assessment is below 5, students may retake the failed written tests during the final exam.

The two partial exams may be retaken together on a date set by the course coordination. To be eligible for the retake, the average grade of the continuous assessment-based on classroom and field activity reports and the independent coursework-must be equal to or greater than 5.

This subject is included in the single assessment. This will consist of an examination of all the contents of the subject which will correspond to 60% of the grade and the presentation of 4 works from the practical activities included in the subject, which will count for 40% of the grade of the subject. The exam will be held at the same time as the second part of the continuous assessment. The recovery of the single assessment will be done on the same day as the recovery of the continuous assessment.

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Software

To solve the practical activities we will use:

-Google Earth

-GIS software

-Global Mapper

-Microsoft Excel

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 |
|----------------------------|-------|----------|-----------------|---------------|
| (PAUL) Classroom practices | 1 | Catalan | second semester | morning-mixed |
| (PCAM) Field practices | 1 | Catalan | second semester | morning-mixed |
| (TE) Theory | 1 | Catalan | second semester | morning-mixed |