# Integrative Project I: Physical and Biotic Environments

Code: 106761
ECTS Credits: 6

2025/2026

| Degree | Type | Year |
|---|---|---|
| Environmental Sciences | OB | 2 |

## Contact

Name: Joan Bach Plaza

Email: joan.bach@uab.cat

## Teachers

Sara Dallares Villar

Jose Gabriel Salminci Panizo

## Teaching groups languages

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

## Prerequisites

No specific prerequisites are required, but prior knowledge of Earth Sciences and Biology will be very helpful.

## Objectives and Contextualisation

The subject aims to provide students with criteria and methodologies that allow them to better understand how the dynamics of the physical environment relate to and interact with biological systems.

The learning will be approached by applied methodologies, through the analysis of real case studies that will address environmental problems, closely related to some of the main geological (geomorphological, hydrogeological and geoanthropic) and biological (vegetation and its dynamics , herbivory, predation and pollination) of the territory. More specifically, it is proposed to work on two levels: on the one hand, the basic knowledge and principles achieved in the various subjects studied so far will be integrated and, on the other hand, these principles will be concreted in examples at a local and regional scale, introducing the concept of basin system and relating it to the associated biological system. The main product of the subject will be the elaboration, by the students, of GeoBioEnvironmental Projects that will address some of the environmental problems that occur in the study area.

## Learning Outcomes

1. CM30 (Competence) Evaluate real case studies on environmental problems and conflicts.
2. CM31 (Competence) Evaluate factors related to the Sustainable Development Goals associated with a specific environmental problem.
3. CM32 (Competence) Undertake environmental projects based on real case studies, working in small groups.
4. KM38 (Knowledge) Indicate the main dynamics and relationships between the physical-abiotic environment and biological systems.
5. SM38 (Skill) Incorporate the scientific, technological and social knowledge associated with a specific available problem.
6. SM39 (Skill) Apply the main techniques and elements for environmental sampling and to obtain qualitative and quantitative data relevant to environmental sciences.
7. SM40 (Skill) Critically examine public and scientific information on the environment, in relation to a specific problem.
8. SM41 (Skill) Use techniques, material and instruments related to the collection of geological and/or biological samples in the field.

## Content

Topics addessing geomorphology, hydrology-hydrogeology, fauna and flora, ecology, and agricultural, branch, ar

profits, applied to the identification, quantification, and diagnosis of environmental problems.

## Activities and Methodology

| Title | Hours | ECTS | Learning Outcomes |
|---|---|---|---|
| Type: Directed | | | |
| Field Trip to be determined | 40 | 1.6 | CM30, CM31, CM32, KM38, SM38, SM39, SM40, SM41, CM30 |
| Practical work in a natural environment - Campus UAB | 4 | 0.16 | CM30, CM31, CM32, KM38, SM38, SM39, SM40, SM41, CM30 |
| Theoretical classes | 6 | 0.24 | CM31, KM38, CM31 |
| Type: Autonomous | | | |

| | | | |
|---|---|---|---|
| Project - Collective work and study | 87 | 3.48 | CM30, CM31, CM32, KM38, SM38, SM39, SM40, SM41, CM30 |

The learning methodology will include tasks developed both in the natural environment (in the field) and in the office (in the classroom-laboratory). A specific study area will be visited (to be determined), where geomorphology, hydrology-hydrogeology, fauna and flora, ecology, and agricultural, livestock and forestry issues will be addressed. During the field work, students will become familiar with the techniques of landscape recognition and interpretation and will work with the different scales, both spatial and temporal. It will also be introduced in the activities of sampling and analysis of biological samples, as well as treatment of the data obtained.

In the classroom, students will acquire skills for the development of conceptual models and hydro-bio-environmental numerical models, which they will build and feed with the data they have generated during the field and cabinet tasks and others that may be needed and that will search later. Numerical modeling can be done with the help of specific freely accessible software. There will be a work and oral presentations by groups on the studied area.

THEORETICAL SYLLABUS and PREPARATION FOR THE FIELD TRIP (TE: 6h).Theoretical training on basic concepts, essential for the good development of the Project. This training will aim to integrate and complement the concepts achieved in the previous subjects, and to introduce students to the techniques of data acquisition in the field, sampling-analysis and construction-exploitation of models.

Introduction to the research area and background study.

Introduction to environmental geophysical research techniques. Data acquisition methodologies in the field, processing and modeling

LABORATORY PRACTICES - UAB CAMPUS. (PLAB: 4h). Laboratory practices in a natural environment at the UAB Campus. Characterization of natural watersystems and hydro-environmental sampling.

FIELD TRIP(PCAM and PCAMs: 40 hours; 5 days with overnight stay). Observation, description, measurement/sampling and analysis of the physical and biotic environment in a Basin system. Identification and diagnosis of environmental problems. Techniques for recognition, measurement and analysis of geobioenvironmental variables "in situ".

ORIENTATION FOR PERFORMING OF COLLECTIVE WORK and EVALUATION. Structure of the Project report (collective work conducted by students' teams) to be delivered by and its evaluation.

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

## Continous Assessment Activities

| Title | Weighting | Hours | ECTS | Learning Outcomes |
|---|---|---|---|---|
| Collective work. Oral defense | 35 | 0.5 | 0.02 | CM30, CM31, CM32, KM38, SM38, SM39, SM40, SM41 |
| Collective work. Poster | 35 | 8 | 0.32 | CM30, CM31, CM32, KM38, SM38, SM39, SM40, SM41 |
| Practice. Individual work | 30 | 4.5 | 0.18 | CM30, CM31, CM32, KM38, SM38, SM39, SM40, SM41 |

Collective work-Project: Report (35%) and oral presentation in front of the big group (35%).

The project will include the approach of a GeoBioEnvironmental problem, the synthesis of the results obtained a

diagnosis, and a solution proposal.

Individual work, attitude and assistance during practices, and field trip (30%).

Delivery of individual practical exercises.

For students evaluated on a maximum of 25% of the evaluative items that abandons the course, final grade will

NOT ASSESSABLE.

## Bibliography

Maps:

http://www1.igc.cat/web/gcontent/pdf/mapes/igc_GT2_290q21_66x23_v1g.pdf
http://www1.igc.cat/web/gcontent/pdf/mapes/igc_GT2_290q12_65x24_v1g.pdf

Articles:

Linares, R.; Rosell, J.; Roqué, C.; Gutiérrez, F. Origin and evolution of tufa mounds related to artesian karstic springs in Isona area (Pyrenees, NE Spain). *Geodinamica Acta*. 2010, vol. 23, num. 1-3, p. 129-150. doi: 10.3166/ga.23.129-150.

Linares, R.; Rodríguez, J.A.P. Tufa mounds on Earth and Mars. Featured image of July, in IAG Planetary Geomorphology Working Group. 2011.

Linares, R.; Zarroca, M.; Rodríguez, J.A.P. *Mart a Catalunya*. Nota de Premsa. UAB. 2011.

Pellicer, X.M.; Linares, R.; Gutiérrez, F.; Comas, X.; Roqué, C.; Carbonel, D.; Zarroca, M.; Rodríguez, J.A.P. Morpho-stratigraphic characterization of a tufa mound complex in the Spanish Pyrenees using ground penetrating radar and trenching, implications for studies in Mars. *Earth and Planetary Science Letters*. 2014, vol. 388, p. 197-210.

Zarroca, M.; Pellicer, X.M.; Gutiérrez, F.; Carbonel, D.; Roqué, C.; Linares, R. *Characterising tufaceous accumulations in groundwater discharge zones by means of geophysical surveying (ERT, GPR) and trenching. The Isona-Basturs complex (Pyrenees, NE Spain)*. 8th IAG/AIG International Conference on Geomorphology, Geomorphology and Sustainability, Paris, France. 2013, August 27-31.

https://ddd.uab.cat/pub/uabdivulga/uabdivulga_a2015m1/uabdivulga_a2015m1a9.pdf

http://www.psi.edu/pgwg/images/jul11image.html

Linares, R.; Rosell, J.; Pallí, L.; Roqué, C. 2002. Afforestation by slope terracing accelerates erosion. A case study in the Barranco de Barcedana (Conca de Tremp, NE Spain).Environmental Geology volume 42, pages 11-18

Roqué, C.; Linares, R.; Zarroca, M.; Rosell, J.; Pellicer, X.M. & Gutiérrez, F. 2013. Chronology and paleoenvironmental interpretation of talus flatiron sequences in a mountainous area: Tremp Depression, Spanish Pyrenees. Earth Surface Processes and Landforms 38: 1513-1522. doi: 10.1002/esp.3391.

https://www.uab.cat/web/detall-de-noticia/descoberts-nous-registres-paleoclimatics-a-la-conca-de-tremp-134546

https://www.uab.cat/web/detall-de-noticia/quan-les-muntanyes-es-mouen-1345469002000.html?articleId=134565

Books:

C. Philip Wheater, James R. Bell, Penny A. Cook. 2020. Practical Field Ecology: A Project Guide, 2nd Edition, 480pp.
https://www.wiley.com/en-us/Practical+Field+Ecology:+A+Project+Guide,+2nd+Edition-p-9781119413226

## Software

Does not apply.

## 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 | first semester | morning-mixed |
| (PCAM) Field practices | 2 | Catalan | first semester | morning-mixed |
| (PCAM) Field practices | 3 | Catalan | first semester | morning-mixed |
| (PCAM) Field practices | 4 | Catalan | first semester | morning-mixed |
| (PLAB) Practical laboratories | 1 | Catalan | first semester | afternoon |

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|---|---|---|---|---|
| (PLAB) Practical laboratories | 2 | Catalan | first semester | afternoon |
| (PLAB) Practical laboratories | 3 | Catalan | first semester | afternoon |
| (PLAB) Practical laboratories | 4 | Catalan | first semester | afternoon |
| (TE) Theory | 1 | Catalan | first semester | morning-mixed |