

Global Change

Code: 42404
ECTS Credits: 9

2024/2025

Degree	Type	Year
4313784 Interdisciplinary Studies in Environmental, Economic and Social Sustainability	OT	0

Contact

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Teachers

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Teaching groups languages

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

Prerequisites

Students should preferably hold an undergraduate degree with relevance to environmental sciences, biology, geography, Earth and marine sciences or ecology, although students with a background in social and political sciences are also welcome and should be able to follow the course provided, they are acquainted with basic principles of Earth and physical sciences.

A reasonable level of English speaking and writing skills are recommended to follow the course.

Objectives and Contextualisation

The understanding of the biological, physical, and social processes related to Global Change, and their interaction, are some of the main current challenges, not only because of its complexity, but also due to the necessity of finding solutions to the negative impacts caused by such changes.

The course covers many of the diverse types of impacts related to Global Change on different spatial and temporal scales, mainly focused on different types of ecosystems (terrestrial and marine) as well as its effects on society, and the social responses.

The main objectives of the course are summarized below:

- to identify different types of impacts related with global change

- to explore a wide variety of spatial and temporal scales of global changes
- to consider other driving forces that interact with global change processes
- to analyze global change manifestations from both terrestrial and marine systems such as biodiversity loss, perturbation of the global carbon cycle, ecosystem degradation, land use.
- to identify different approaches to global change through the analysis of protected areas (biosphere reserves, marine protected areas, marine restoration, rural landscapes, etc.)

Competences

- Analyse how the Earth functions on a global scale in order to understand and interpret environmental changes on the global and local scales.
- Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
- Communicate orally and in writing in English.
- Continue the learning process, to a large extent autonomously.
- Seek out information in the scientific literature using appropriate channels, and use this information to formulate and contextualise research in environmental sciences.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Work in an international, multidisciplinary context.

Learning Outcomes

1. Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
2. Communicate orally and in writing in English.
3. Continue the learning process, to a large extent autonomously.
4. Know the ways in which global change shows itself in different ecosystems.
5. Seek out information in the scientific literature using appropriate channels, and use this information to formulate and contextualise research in environmental sciences.
6. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
7. Work in an international, multidisciplinary context.

Content

The course is organized as follows:

Sub-Module 1: Terrestrial Global Change

1. Introduction to the interdisciplinary approach on Global Change.
2. Responding Locally to Global and Globalizing Changes: land use/cover change.
3. Agriculture and Global Change.
4. Acceleration of the hydrological cycle under global warming.
5. Forest Management as a key factor of global change. Sustainable forest management and its revalorization.
6. Forest health.
7. Environment and human health.
8. The Conceptual Framework of (Urban) Ecosystem Services and Green Infrastructure.
9. Assessing (Urban) Ecosystem Services: Methodological Approaches.
10. Oral presentations.

Sub-Module 2: Marine Global Change

1. Introduction to ocean, climate, and global change. The perturbation of the carbon cycle and the consequences on the marine ecosystems and biogeochemistry
2. Cumulative pressures on the marine system focusing on marine pollution, marine litter and micro-plastics
3. Considering different temporal scales of global changes from marine historical ecology and paleo-reconstructions. Discussing the new trend in blue economy focusing on blue carbon. Marine Protected Areas, ocean conservation and restoration.
4. Oral presentations

Sub-Module 3: Field trips

- New trends in Mediterranean landscapes conservation (Montseny Natural Park and Biosphere Reserve).
Pending: there might be another short field trip.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Lectures	42	1.68	2, 4, 5, 7
Theory lessons in fieldwork	6	0.24	3, 4, 7
Type: Supervised			
Fieldwork	6	0.24	4, 6
Tutorship	34	1.36	1, 5, 6
Type: Autonomous			
Oral presentation training	40	1.6	3, 4, 5, 6, 7
Reading articles, books and studying for each of the given lectures and the final exam	91	3.64	1, 3, 4, 5, 6

Teaching and discussions will occur during lectures, guided by readings assigned in advance by individual instructors.

The course also includes fieldwork to explore local-scale manifestations of Global Change impacts.

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
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Class assignments	20%	0	0	3, 4, 7
Final Exam	50%	3	0.12	1, 2, 6
Two oral presentations	30%	3	0.12	1, 3, 4, 5, 6, 7

The final mark will be the weighted average of the following assessments:

Type	Grade percentage (%)	Comments
Oral presentations	30	Two oral presentations (15% each one) covering Terrestrial and Marine Global Change
Class assignments	20	One class assignment covering Terrestrial Global Change
Final test	50	3-hour test covering most aspects of the course but Forest Health. In this case a take-home test will be provided.

If a student fails to reach 40% of each one of the assessment types (12%, 8% and 20% for oral presentations, class assignments and final test, respectively) the student will have to repeat the test or the assignment to be able to pass the subject (in this case the student will be contacted to schedule another assignment submission or test date). Moreover, the student must have 50% of the final grade to be able to pass the subject.

IMPORTANT:

- In the final exam the students will have limited space to answer each of these questions and will have to prove that they have understood, and master key concepts and ideas introduced during the course.
- A mandatory field trip to the Montseny Natural Park and Biosphere Reserve to explain the local effects of Global Change in a Mediterranean landscape will be carried out. You will need to bring adequate clothing.
- Their assistance and participation in class will be considered for grading the students.

IRREGULARITIES BY THE STUDENT, COPYING AND PLAGIARISM

Assessment activities qualified in this way and by this procedure will not be recoverable. If it is necessary to pass any of these assessment activities to pass the subject, this subject will be suspended directly, with no opportunity to recover it in the same course. These irregularities include, among others:

- total or partial copy of a practice, report, or any other assessment activity;
- allow the copying of any assessment to other students;
- present group work not done entirely by group members;
- present as own materials prepared by a third party, even if they are translations or adaptations, and in general works with non-original and exclusive elements of the student;
- have communication devices (such as mobile phones, smart watches, etc.) accessible during individual theoretical-practical assessment tests (exams).

EVALUATION OF REPEATER STUDENTS

In the case of repeater students, it will not be possible to keep the previous grades for the course's practices. Without prejudice to other disciplinary measures that are deemed appropriate, and in accordance with current academic regulations, irregularities committed by a student that may lead to a variation of the grade will be graded with a zero (0).

Bibliography

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Marine Global Change

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Software

Specific GIS software might be used to complete the course: ArcGIS Pro, MiraMon or QGIS. All of them are freely available for SAES students.

Language list

Name	Group	Language	Semester	Turn
(TEm) Theory (master)	1	English	first semester	afternoon