

Degree	Type	Year	Semester
4313784 Interdisciplinary Studies in Environmental, Economic and Social Sustainability	OT	0	1

Contact

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Use of languages

Principal working language: english (eng)

Teachers

Patrizia Ziveri

Carles Barriocanal

External teachers

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Prerequisites

Students should preferably hold an undergraduate degree with relevance to environmental sciences, biology, geography 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 focussed 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 bellow:

- to identify different types of impacts related with global change
- to explore a wide variety of spatial and temporal scales

- to distinguish other driving forces that influences on global change (for example, climate)
- to analyse global change manifestations from land use, biodiversity, global carbon cycle, impacts and effects on ecosystems, both terrestrial and marine.
- to identify different approaches to global change through the analysis of protected areas (biosphere reserves, marine protected areas, rural landscapes....)

Skills

- 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

M.0. Welcome and introduction

M.1. Terrestrial global change

1. Forest Management as a key factor of global change
 - 1.1. Dynamics of vegetation
 - 1.2. Biological fundamentals and strategic silvicultural actions
 - 1.3. Plantations versus forests
 - 1.4. Sustainable forest management and its multidimensionality
 - 1.5. Great Forest Fires in Mediterranean landscapes
2. Natural Protected Areas and its demonstration and monitoring role in global change
 - 2.1. Biosphere Reserves - Mediterranean Network of Biosphere Reserves
3. Global Change indicators
 - 3.1. Socioecological indicators in Mediterranean River Basins
 - 3.2. Sentinel landscapes as bioindicators of global change
 - 3.3. Socioecological analysis of landscape transformation
4. Re-valorisation of rural landscapes and new trends in ecotourism
5. Communicating the global change - Knowledge Transfer and environmental education.

M.2. Marine Global Change

1. The impacts of global environmental changes on marine ecosystems and biogeochemistry and complexity through multidisciplinary investigation of key plankton groups
2. The links between CO₂ dynamics and primary production and calcification of marine organisms
3. The effects of man-made climatic and non-climatic environmental drivers still integrating modern and past global change impacts
4. The disturbance of the capacity of marine systems to provide ecosystem services, which consequently affect economic activities and human welfare
5. Marine Protected Areas and its sustainable management

M.3. Interdisciplinary approaches to global change

1. Participatory mapping and PGIS
2. Participatory spatial planning & management
3. Community-based Natural resource Management

M.4. Fieldwork

- New trends in forest management in Mediterranean landscapes (Les Gavarres)
- International UNESCO Centre for Mediterranean Biosphere Reserves

Methodology

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

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

Activities

Title	Hours	ECTS	Learning outcomes
Type: Directed			
Fieldwork	12	0.48	4, 3, 7
Lectures	48	1.92	5, 2, 4, 7
Type: Supervised			
Final Exam	3	0.12	2, 6, 1
Type: Autonomous			
Reading articles, books and studying for each of the given lectures and the final exam	81	3.24	5, 4, 6, 1, 3
Two short essays	33	1.32	5, 4, 6, 3, 7

Evaluation

Students will be assessed on the basis of:

- A final exam that will last 3 hours and cover most aspects of the course. 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.
- Two written 1500-words essays corresponding to two topics addressed during the course. The teachers will assess the essay following their own marking criteria, taking chiefly into account ability to identify and synthesize relevant literature for a given topic and grasp the correspondent ideas and arguments.
- Fieldworks in order to prove the local effects of Global Change in a Mediterranean landscape
- Their assistance and participation in class.

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

- Final exam: 50%
- Two written essays: 30% (15% each)
- Fieldwork: 20% (10% each)

Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Fieldwork	20%	12	0.48	4, 3, 7

Final Exam	50%	3	0.12	2, 6, 1
Two written essays	30%	33	1.32	5, 4, 6, 1, 3, 7

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