



UNIVERSIDAD  
DE GRANADA



CENTRO DE  
LENGUAS  
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**Climate change:  
causes and effects from  
a multidisciplinary  
approach**

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## **Climate change: causes and effects from a multidisciplinary approach**

### **Summary**

The course aims to be an approach to the problems associated with climate change to raise awareness of the important role played by human beings. Under an interdisciplinary approach, aspects such as global warming, the exploitation of natural resources, environmental education, green chemistry, soil, sea level, climate denialism, legal protection of the environment, the sustainable development goals or the circular economy.

Different areas of knowledge will investigate the causes and effects of climate change, analysing how citizens can mobilize around the challenges presented by rapid climate change, which at the same time affects the social well-being of citizens while negatively affecting the well-being of ecosystems and the balance of life cycles of essential elements for life on our planet.

### **Contents program**

#### THEORETICAL CONTENTS:

- \* **Natural resources, sustainability and climate change (Prof Morales Ruano)**

Different aspects on natural resources, sustainable management and their role in the fight to minimize climate change are addressed (need for its use, its sustainable management, circular economy of resources and multi-R policies), the role of mineral resources in achieving many SDGs and as a tool in the fight against climate change.

- \* **Soil: the great unknown in the fight against climate change (Prof Martín Peinado)**

The aim is to raise awareness of the essential role of soil in the fight against global warming; the role of soil as a basic element of terrestrial ecosystems; current problems of soil degradation and its influence on life cycles; ecological restoration techniques and appropriate agricultural management, to know the capacity of soils as carbon storage; soil as a basic and essential resource for maintaining life cycles and food security.

- \* **Chemistry and Climate Change: Chemistry for a more sustainable world (Prof Bagur González)**

Students are expected to learn about different aspects related to the role of chemistry and its influence on climate change; chemistry, environment and sustainability; the life cycle of a product; green chemistry and the SDGs; Green Analytical Chemistry and its contribution in the assessment of the environmental impact generated by the exploitation of natural resources.

- \* **Global warming in the coastal strip: scenarios, impacts and adaptation/mitigation measures. (Prof Ortega Sánchez)**

It will show the main effects that global warming, intensified by human activity associated with climate change, will have on the coast. In particular, the most relevant effects will include: (1) the decrease in river sedimentary input, (2) the rise in mean sea level, (3) the change in wave propagation patterns, and (4) the increase in coastal flooding.

- \* **What is circular economy? Theory and reality (Prof Delgado Márquez)**

Students will be able to approach, through real examples, the pillars of the Circular Economy: What is the Circular Economy? (concept, principles, why is it necessary, the butterfly diagram, ...); the Circular Economy and the Sustainable Development Goals; the

value of companies in the Circular Economy (analysis of business strategies, industrial symbiosis, examples of adaptation to the Circular Economy).

\* Environmental education and climate change (Prof Carrillo Rosúa)

Environmental education is a tool to promote knowledge, procedures and values of more sustainable and ethically responsible lifestyles, and thus to address environmental issues such as climate change. It reflects on how we learn and what strategies we can follow to train school children and the general public in the scientific bases of climate change and in the adoption of attitudes and behaviors more supportive and respectful of the environment.

\* Underestimation of risk in public perception of climate change impacts (Prof Moreno Muñoz)

Aspects related to the relationship between sustainability objectives, responsible consumption patterns and economic development models will be analysed; social and methodological factors involved in the underestimation of risk due to potentially catastrophic climate-related phenomena; the extent of climate denialism in academia and the media; biases with distorting effects on risk estimations.

\* International and European environmental protection from a national perspective (Prof Ozana Olariu)

The environmental protection dimension is addressed from various fields (from international to local), analysing the political perception of environmental, sustainability and climate change needs and objectives; strategies and action plans adopted in different fields (from the international to the local), underlining the difficulties of the cooperation processes between administrations/states, the institutions involved and the main policy instruments that have been adopted in the climate change process.

## THEMATIC VISITS:

### Seminars/Workshops

\*Visit to the laboratory of the Environmental Flow Dynamics Research Group. In particular, we will visit the Wind Tunnel, the Surf Channel and the Atmosphere-Surf Interaction Channel, which will allow us to model and study in the laboratory numerous physical processes related to the effects of global warming on the coast.

\*Guided visit to the Soil Museum of the Faculty of Sciences where the importance of soils for the development of life will be discussed, some of the most important problems affecting their degradation will be discussed, some case studies will be discussed and some representative soils described.

\*Guided tour of the mineral and rock collections of the Faculty of Sciences (mineral museum, lithotheque, mineral collections...) in which the importance of minerals, their classification, properties and uses, as well as that of some representative rocks, will be discussed.

## Methodology

The teaching methodology and the resources used will vary greatly, depending on the nature of the topic being addressed at each moment, including the following:

- Master class, encouraging participation and group or individual work.
- Seminars showing theoretical aspects and practical examples.
- "Brainstorming", "Aronson jigsaw" and "cases study".
- Student exhibition and debate on proposed topics.
- Development of small research projects.
- Visits to laboratories, collections and scientific facilities

All CLM classes follow the integration of skills, student involvement in tasks, group dynamics and pragmatic, socio-cultural and scientific-technical value of the topics. The tasks are oriented towards the integration of the student in an immersive situation in addition to personal work.

## Evaluation

1. Attendance at 80 per cent of activities is mandatory to qualify for evaluation.
2. Evaluation criteria:
  - **Active participation, continuous evaluation 80%.** In class, complementary tasks and other activities proposed throughout the course such as research work, projects and individual and group presentations.
  - **Knowledge assessment 20%.** The evaluation test will consist of the individual writing of a report. This should summarize the highlights found from a research conducted by the student on one of the effects produced by climate change. Its length will be between 2 and 4 pages. At all times the student will have the help and guidance of the teacher.

## Bibliographical references

Given the variety of topics to be addressed the bibliography would be very extensive to be exposed here. In each activity, teachers will distribute the basic bibliography as well as a repertoire of additional resources so that the student can expand his knowledge in the topic addressed