UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Plants and Global Change

2526-1-F7603Q024-F7603Q02401

Aims

The module 'Plants and Global Change' aims to provide students with an understanding of plant biodiversity and the impact of global change drivers on it. Starting with the basics of plant ecology and ecosystems, the course will focus on how global change can affect plant biodiversity and the role of plants and habitats in providing various ecosystem services that are fundamental to life on Earth. In the context of global change and severe biodiversity loss, the course will provide insights into two major processes that are closely linked to global change: species extinction and biological invasions. The challenges of halting or at least mitigating these two processes will be discussed, with practical implications for the tools and techniques available to monitor the impacts and changes in the conservation status of threatened plants and habitats, as well as the introduction and spread of invasive alien species. The course will provide the knowledge and methodological basis to critically analyse the effects of actions and projects on plant and habitat diversity as well as on the risk of promoting biological invasions. This would contribute to the planning and implementation of reliable sustainable solutions respectful of plant biodiversity and ecosystems.
The topics of this module are closely related to the other two modules of the course and common case studies will be analysed and discussed to provide the necessary interdisciplinary understanding of the relationship between biodiversity and sustainability.

Students are invited to consult the syllabus of the entire course for details regarding learning- and skill-related objectives.

Contents

• Basics of plant ecology and ecosystem functioning.
• Plant biodiversity in the context of global change.
• Ecosystem services provided by plants and habitats.
• Process leading to species extinction and habitat loss.
• Biological invasions and negative impacts derived from the spread of invasive alien species.

• Tools and measures to monitor and enhance the conservation status of species and habitats.
• Tools and measures to prevent and manage the introduction and spread of invasive alien plants.
• Sustainable practices and protocols to conserve plants and ecosystems and prevent biological invasion in current economic schemes.

Detailed program

• Basic understanding of plant life and plant interactions with the environment and other organisms.
• From individuals to plant communities: species, habitats and biomes.
• Plants and habitats as key components in providing ecosystem services fundamental to life on the earth.
• Basics on ecological indicators and techniques to monitor plant and habitat diversity and richness.
• The biodiversity crisis: extent and causes of species and habitat loss.
• Conservation efforts to tackle with biodiversity crisis: international regulation and in situ and ex situ conservation strategies.
• Resources and metrics to monitor conservation status of species and ecosystems.
• Red list of threatened species and ecosystems: a shared international protocol to assess the risk of extinction of species and ecosystems.
• Biological invasions: how plants take advantage of global change to spread all over the world.
• The importance of managing biological invasions: environmental, social and economic impacts of invasive alien plants.
• Human-mediated pathways of introduction and spread of invasive alien plants.
• Strategies to manage biological invasions: international regulation and practical approaches.
• Resources, metrics and techniques to monitor biological invasions and their impacts.

Prerequisites

• Basic knowledge of plant biology.
• Basic notions of environmental sustainability.

Teaching form

2 CFUs of mixed theoretical and interactive lessons (20 hours):
• 7 two-hour lectures, in person, mostly frontal teaching and discussion in class, Delivered Didactics;
• 3 two-hour lectures, mixed didactics in the classroom, to collect information and critically analyse real-world case studies in common to other modules, Interactive Didactics.

Attendance to lectures and interactive exercises is highly recommended.

Textbook and teaching resource

• slides
• notes shown during lectures and additional material on selected topics, i.e., scientific articles, made available on the e-learning website of the course

Semester

II semester (March - June)

Assessment method

The final exam consists of a critical dicsussion of a case study common to the three modules of the laboratory course, with the discussion covering various topics covered in the course, with an emphasis on the connections between concepts and processes, such as to arrive at a critical evaluation of the analyzed case study from the point of view of sustainability in biodiversity conservation. A single oral exam at the end of the course is facultative: it may be a supplementary test requested by teachers or students.

The final score will be between 18/30 and 30/30 *cum laude*, based on the overall assessment considering the following criteria:
(1) knowledge and understanding;
(2) ability to connect different concepts;
(3) autonomy of analysis and judgment;
(4) ability to correctly use scientific language.

Office hours

Always, after scheduling an appointment *via* phone or e-mail.

Sustainable Development Goals

QUALITY EDUCATION | SUSTAINABLE CITIES AND COMMUNITIES | RESPONSIBLE CONSUMPTION AND PRODUCTION | CLIMATE ACTION | LIFE BELOW WATER | LIFE ON LAND