UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Applied Botany

2526-1-F7503Q008

Aims

The aim of the course is to provide expertise in the Botany application fields. The course is organised in two sections: a theoretical and a practical field section.

Specifically:

1. Knowledge and understanding

At the end of the course, in addition to the principles at the basis of Plant Ecology, the student will have acquired the theoretic principles and the applicative techniques for (a) the analysis of plant biodiversity, (b) the environmental quality assessment by plants, (c) the environmental restoration (renaturation and phytoremediation) and (d) the bioenergy production

2. Applying knowledge and understanding

At the end of the course the student must be able to apply the acquired knowledge to the resolution of real environmental problems

3. Making judgements

The student will be able to process the theoretical and practical knowledge acquired during the course to select the best approch in solving environmental problems (related to the course topics)

4. Communication skills

At the end of the course the student will acquire not only the ability to express himself with an appropriate scientific language, but also the ability to relate to external operators in the environmental sector

5. Learning skills

At the end of the course the student will have acquired all the competences to autonomously face the resolution of environmental problems related to the lesson topics

Contents

· Principles of plant ecology and their application to the analysis of plant biodiversity:

· Environmental quality assessment by plants: theory and applicative technologies

· Restoration ecology and Phytoremediation: theory and applicative technologies

· Bioenergy production: scientific principles and technologies

Detailed program

· Plant ecology: basic knowledge and main techniques;

. Biodiversity and agrobiodiversity;

· Biodiversity at species level;

· Biodiversity assessment;

· Biodiversity distribution at world and local level; hot spots;

· Causes of biodiversity loss

· Biodiversity orotection and ecosystem services;

· Red lists and plant reintroduction;

· Biological invasion: the contrast of alien species spreading;

· Plants as bioindicators and biosensors;

· Mosses, Lichens and Vascular plants for air and water biomonitoring;

· Soil biomonitoring;

. Restoration ecology: techniques for the restoration of degraded, damaged, or destroyed ecosystems and habitats in the environment such as quarry areas

· Phytoremediation technologies: continuous and induced phytoextraction, rhizofiltration, phytostabilization and phytovolatilization;

· Plant-based biomass for energy production (biodiesel and bioethanol)

Field activities will be addressed to the application of the various techniques explained during lectures and to the visit of phytoremediation and bioenergy production plants.

Prerequisites

General Botany

Teaching form

- 16 two-hour lessons delivered as face-to-face lectures (DE), 4 CFU
- 1 twenty-hour fieldwork session of interactive teaching (DI) delivered in person, 2 CFU

The course includes the presentation and discussion of real-world case studies

Textbook and teaching resource

Papers and slides given by elearning

Semester

semester 2

Assessment method

written exam consisting of questions related to all the lesson contents and to the field activities. During the exam the candidate must demonstrate the ability of addressing and critically discussing the topics (theory and techniques)also in relation to the solving of real environmental problems.Oral assessment is optional upon the request of the student or the teacher.

During the course, two written "in itinere" assessments, consisting of open questions are planned. Overcoming the two assessments replaces the exam at the end of the course.

Office hours

by appointment via email

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | AFFORDABLE AND CLEAN ENERGY | RESPONSIBLE CONSUMPTION AND PRODUCTION | CLIMATE ACTION