



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### Applied Botany

2324-1-F7501Q040

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#### 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 approach 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 protection 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**

- Lessons tutorials, credits 4 - 32 hours
- Field laboratory, credits 2 - 20 hours

## **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

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