UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# COURSE SYLLABUS

# Plant Physiology

**2122-3-E3201Q082**

## Aims

Aim of the course is the knowledge of the main aspects of plant physiology and biochemistry. 1. Knowledge and understanding: at the end of the course students will have acquired knowledge of the main physiological and biochemical processes of plants. 2. Applying knowledge and understanding: the learned concepts allow to understand the fundamental role of plants in the environment. 3. Making judgements: at the end of the course students will be able to understand the mechanisms of the described physiological and biochemical processes and to establish the correct relations among them. 4. Communication skills: at the end of the course students wil have acquired an adequate scientific language and will be able to properly explain the treated topics. 5. Communication skills: at the end of the course students will be able to read the scientific literature and to further pursue personal studies.

## Contents

Carbon assimilation: photosynthesis. The light reactions and C3, C4, CAM cycles. Ecophysiological aspects of photosynthesis. Nitrogen assimilation: nitrogen sources (nitrate, ammonium, $NO_x$). Sulphur assimilation: sulphur sources (sulphate, sulphur oxides). Uptake and transport of water and solutes. Phloem translocation. Growth and differentiation.

## Detailed program

- Carbon assimilation. Photosynthesis. The light reactions and the C3 cycle. $CO_2$ concentrating mechanisms: C4 and CAM plants. Ecophysiological aspects of photosynthesis. Environmental factors influencing $CO_2$ assimilation.

-Nitrogen assimilation: nitrogen sources, assimilation of nitrate and ammonium, possible use of $NO_x$.

-Sulphur assimilation: sulphur sources, assimilation of sulphate, possible use of sulphur oxides.

- Uptake and transport of water and solutes. Soil and plant water potential. Water transport. Transpiration. Ion uptake and mineral nutrition. Gas exchanges and regulation by environmental factors. Phloem translocation of organic solutes.

-Growth and differentiation: plant hormones, tropisms.

## Prerequisites

None

## Teaching form

Lessons, 6 credits.

## Textbook and teaching resource

L. Taiz, E. Zeiger, Fisiologia vegetale, Quarta Edizione, Edizione italiana a cura di Massimo Maffei, Ed. Piccin

## Semester

First semester

## Assessment method

- Oral examination

An argument of student's choice and a question of the teacher. Besides knowledge the use of an adequate scientific language to explain the topics and the ability to link them will be evaluated.

Mark range 18-30/30

## Office hours

By appointment (contact: raffaella.cerana@unimib.it)