BIOL2180 Plant physiology

[45h+15h exercises] 5 credits

This course is taught in the 2nd semester

Teacher(s): Jean-Marie Kinet, Jean-François Ledent
Language: French
Level: Second cycle

Aims

To understand the basic principles that govern plant functioning at the whole organism level and the main processes that condition its growth and development. This course prepares students for plant biology courses they will have to follow later during their training.

Main themes

1/ Plant water relationships. Water potential, water absorption by the root, water pathway in the soil-plant-atmosphere continuum, stomatal regulation, importance of water relationships at both cellular and tissue levels.
2/ Mineral nutrition. Interactions between the root system and the soil. Essential elements: concepts and roles. Nitrogen, sulphur and phosphate assimilation. Cellular and intercellular transports.
3/ Photosynthetis: Structure of the photosynthetic apparatus. Light and dark reactions. C3 photosynthetic carbon reduction cycle. C2 photorespiratory carbon oxidation cycle. CO2 concentrating mechanisms. Synthesis of sucrose and starch. Gas exchanges and water use efficiency. Assimilate transport: phloem loading and unloading, assimilate allocation and partitioning, sink to source relationships.
4/ Growth and development. Plant growth regulators. Regulation of floral transition. Photoperiodism and vernalisation. Photomorphogenesis and endogenous rhythms. Mechanisms of resistance to abiotic stresses.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Prerequisites: basic courses in botany, chemistry, biochemistry, and physics.
Assisted work: illustration of some parts of the course: hydroponic cultures, mineral deficiency, gas exchanges and chlorophyl fluorescence measurement, stomatal regulation, exogenous growth regulators effects.
Support: syllabus with illustrations, reference book.

Other credits in programs

BIOL21/A	Première licence en sciences biologiques (Biologie moléculaire, cellulaire et humaine)	(5 credits)	Mandatory