

General Information	
Academic subject	Principles of Plant Physiology (I.C. Principles of plant physiology, genetics and biochemistry)
Degree course	Bachelor programme: Food Science and Technology
ECTS credits	3 ECTS
Compulsory attendance	No
Teaching language	Italian

Subject teacher	Name Surname	Mail address	SSD
	<b>Concetta Eliana Gattullo</b>	<a href="mailto:concettaeliana.gattullo@uniba.it">concettaeliana.gattullo@uniba.it</a>	BIO/04

ECTS credits details	
Basic teaching activities	2 ECTS Lectures   1 ECTS Laboratory classes

Class schedule	
Period	II semester
Course year	First
Type of class	Lecture - workshops

Time management	
Hours	75
In-class study hours	30
Out-of-class study hours	45

Academic calendar	
Class begins	March 1 <sup>st</sup> , 2022
Class ends	June 17 <sup>th</sup> , 2022

Syllabus	
Prerequisites/requirements	Knowledge of general biology.
Expected learning outcomes	<p><i>Knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Adequate basic knowledge to understand the main topics of plant physiology</li> </ul> <p><i>Applying knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Ability to identify and distinguish the cause-effect relationships within the various physiological phenomena</li> </ul> <p><i>Making informed judgements and choices</i></p> <ul style="list-style-type: none"> <li>○ Ability to predict and critically discuss the outcomes of the different plant physiological responses</li> <li>○ Ability to acquire the necessary information on plant-environment interactions, and to evaluate their implications in a productive context</li> </ul> <p><i>Communicating knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Ability to express, with a specific and technical language, the knowledge acquired on plant physiology</li> </ul> <p><i>Capacities to continue learning</i></p> <ul style="list-style-type: none"> <li>○ Ability to update and strength own knowledge on plant physiology, also using new communication and information technologies</li> </ul> <p>The expected learning outcomes, in terms of both knowledge and skills, are provided in Annex A of the Academic Regulations of the Degree in Food Science and Technology (expressed through the European Descriptors of the qualification)</p>

<p>Contents</p>	<p><u>Plant cell</u>: general organization, structural and functional traits of cell wall, cell membranes and cell organelles.</p> <p><u>Principles of plant histology</u>: morphological and functional characteristics of meristematic and permanent plant tissues, and their localization in plant.</p> <p><u>Principles of plant anatomy</u>: morphology and anatomy of root, stem and leaf in monocots and dicots; structure and functions of flower, seed, and fruit. Pollination and sexual reproduction of angiosperms.</p> <p><u>Water cycle in the soil-plant-atmosphere system</u>: water potential and its components; cell water potential; water in soil; diffusion, osmosis and mass flow; absorption and movement of water through the xylem; radical pressure; transpiration and its regulation.</p> <p><u>Mineral nutrition and solute transport</u>: essential, accessory and toxic elements for plants; nutrient deficiencies and strategies to overcome them; rhizosphere; plant symbiosis with mycorrhizal fungi and nitrogen-fixing bacteria. Chemical potential of solutes, membrane potential; passive and active (primary and secondary) transport of solutes across the cell membrane; solute movement through symplast, apoplast and trans-membrane way.</p> <p><u>Translocation in the phloem</u>: definition of source and sink; phloem sap composition; phloem loading; pressure-flow model; phloem unloading.</p>
<p>Course program</p>	
<p>Reference books</p>	<ul style="list-style-type: none"> <li>• Taiz L. Zeiger E. Plant Physiology. Fourth Edition. Sinauer Associates Inc., 2006.</li> <li>• Notes of the lectures and other teaching material provided during the course.</li> </ul> <p>For further readings:</p> <ul style="list-style-type: none"> <li>• Mauseth J.D. Plant Anatomy. Benjamin Cummings Publ. Co.Inc. Menlo Park California</li> </ul>
<p>Notes</p>	
<p>Teaching methods</p>	<p>Topics will be illustrated by means of Power Point presentations, and classroom and laboratory exercises.</p> <p>Copies of all Power Point presentations and teaching material used for lectures and practical activities can be requested by e-mail or downloaded from web platforms.</p>
<p>Evaluation methods</p>	<p>The exam consists of an oral dissertation on the topics developed during the theoretical and theoretical-practical lectures, as reported in the Academic Regulations for the Bachelor Degree in Food Science and Technology (article 9) and in the study plan (Annex A).</p> <p>Students attending at the lectures may have a middle-term preliminary exam, consisting of a written test, relative to the first part of the program, which will concur to the final evaluation and will be considered valid for one academic year.</p> <p>The evaluation of the preparation of the student occurs on the basis of established criteria, as detailed in Annex B of the Academic Regulations for the Bachelor Degree in Food Science and Technology.</p> <p>Foreign students may be examined in English language, according to the aforesaid procedures.</p>

<p>Evaluation criteria</p>	<p><i>Knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ In-depth knowledge of main topics of plant physiology in order to understand the interactions between plants and environment</li> </ul> <p><i>Applying knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Ability to correctly evaluate the cause-effect relationships of different physiological responses, and frame them in a wider context of metabolic and environmental interactions.</li> </ul> <p><i>Making informed judgements and choices</i></p> <ul style="list-style-type: none"> <li>○ Ability to interpret, predict and critically describe the outcomes of plant physiological responses. Autonomy in the critical evaluation and interpretation of experimental data and ability to compare them with existing data.</li> </ul> <p><i>Communicating knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Communication with appropriate language, correct use of scientific terms and ability to establish links between the different topics of plant physiology covered in the course.</li> </ul> <p><i>Capacities to continue learning</i></p> <ul style="list-style-type: none"> <li>○ Ability to understand and critically discuss the fundamental aspects of plant physiology, also consulting online databases of scientific literature.</li> </ul>
<p>Receiving times</p>	<p>Visiting hours: from Monday to Friday, by previous agreement. Additional information and material of the course may be requested at the teacher e-mail address.</p>