

General information	
Academic subject	Basic botany – Module (Integrated course Plant Biology)
Degree course	Agricultural Science and Technology
Academic Year	First year
European Credit Transfer and Accumulation System (ECTS)	6 ECTS
Language	Italian
Academic calendar (starting and ending date)	II SEMESTER (1 March - 17 June 2022)
Attendance	Recommended Attendance

Professor/ Lecturer	
Name and Surname	MARIA LETIZIA GARGANO
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Telephone	
Department and address	Department of Agricultural and Environmental Science - ex Agricultural Mechanics section, ground floor, room no. 7
Virtual headquarters	Microsoft Teams Code: w57re8n
Tutoring (time and day)	Use email messages to establish appointments

Syllabus	
Learning Objectives	The course aims to provide basic information on cytology, histology, anatomy, physiology essential to have the appropriate knowledge on the morpho-functional organization and reproductive mechanisms of species of agricultural interest.
Course prerequisites	There are no specific prerequisites other than those required for admission to the degree course.
Contents	<p><u>Elements of Botany</u> (24 hours= 3 ECTS). Animal and plant organisms: similarities and differences. Prokaryotes and Eukaryotes. Autotrophy and Heterotrophy. The molecular composition of plant cells: organic molecules, carbohydrates, lipids, proteins, nucleic acids, secondary metabolites. The plant cell: plasma membrane and types of transport, mitochondria and respiration, plastids, vacuoles, cell wall. Characteristics of the secondary wall and its modifications. Functions; growth and differentiation of plant cells; meristems and plant tissues. Stem, root, and leaves: morphology, anatomy, and functions in Angiosperms (Monocotyledons and Dicotyledons) and Gymnosperms. Types of stem, root and leaves and their modifications. Seed, germination and dissemination. Absorption and transport. Mycorrhizae. Reproduction in plants, types of reproduction, ontogenetic cycles, reproduction of angiosperms and gymnosperms.</p> <p><u>Biochemistry and Metabolism</u> (8 hours= 1 ECTS). Transpiration. Photosynthesis: light phase and dark phase. C4 cycle and CAM. Photorespiration. Nitrogen cycle. Plant hormones: regulatory role and general properties. Tropisms.</p> <p><u>Practical activities</u> (28 hours= 2 ECTS): use of the light microscope. Microscopic examination of: stomata, plastids, starches, vacuolar inclusions, cell walls and parietal modifications. Preparation of histological samples and staining of plant tissues. Observation of anatomical sections of stem, leaves and roots.</p>
Books and bibliography	<p>MAUGINI E., MALECI BINI L., MARIOTTI LIPPI M., 2014 – Botanica Farmaceutica. Piccin.</p> <p>PASQUA G., ABBATE G., FORNI C., 2008 – Botanica generale e diversità vegetale.</p>

	Piccin. ARRIGONI O., 1973 – Elementi di Biologia Vegetale.
Additional materials	As an aid to light microscope observations, we recommend: COLOMBO P., 2003 – Preparati microscopici di Botanica. EdISES

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
150	32	28	90
ECTS			
6	4	2	
Teaching strategy			
Blended learning: The topics of the course will be treated with the help of Power Point presentations, with the support of movies and practical exercises with optical. Sample preparation and observation will be conducted in full compliance with anti-Covid regulations.			
Expected learning outcomes			
Knowledge and understanding on:	<ul style="list-style-type: none"> ○ Knowledge of the major morphological and reproductive characters of spermatophytes; ○ Ability to understand the taxonomic placement of major species of agricultural interest. 		
Applying knowledge and understanding on:	<ul style="list-style-type: none"> ○ Ability to describe and characterize major species of agricultural interest; ○ Ability to identify taxonomic categories of major species of agricultural interest. 		
Soft skills	<ul style="list-style-type: none"> • <i>Making informed judgments and choices</i> <ul style="list-style-type: none"> ○ Capacità di includere i taxa nei diversi ranghi tassonomici. ○ Capacità di identificare le specie di interesse agrario utilizzando i caratteri morfologici. • <i>Communicating knowledge and understanding</i> <ul style="list-style-type: none"> ○ Ability to communicate acquired knowledge and skills with formal and appropriate language. • <i>Capacities to continue learning</i> <ul style="list-style-type: none"> ○ Ability to use the methodological tools and knowledge necessary to successfully undertake the studies envisaged in the Master's degree courses of reference 		

Assessment and feedback	
Methods of assessment	<p>The exam, unique, comprehensive and collegial for the Plant Biology IC, consists of an oral test on the topics developed during the theoretical and theoretical-practical lessons of both modules of the integrated course. Only the positive outcome of the oral test will give rise to the final evaluation of the exam, which will be expressed as the arithmetic mean of the oral tests of the two modules.</p> <p>For the students enrolled in the course year in which the course is held, an exemption test will be held on the topics of lessons and exercises carried out in the period preceding the test (about half of the program). The exoneration, which</p>

	<p>will take place on the dates published in the teaching calendar, will be ...</p> <p>The positive results of the exoneration tests of both modules contribute to the evaluation of the C.I. Plant Biology exam and are valid for one academic year.</p> <p>For the students who have passed the exoneration test, the oral test will focus only on the topics of lessons and exercises carried out in the period following the test itself. In this case, the evaluation of the exam is expressed as the average of the marks obtained in the exoneration, in the written test and in the oral test.</p> <p>Students who are not interested in taking the exoneration test will take the final oral exam as provided for by the Didactic Regulations of the Course of Study.</p> <p>The final exam of foreign students can be held in English.</p>
<p>Evaluation criteria</p>	<ul style="list-style-type: none"> • <i>Knowledge and understanding</i> <ul style="list-style-type: none"> ○ knows correctly the terminology used in Botany ○ knows the relationship between plant morphology and environment • <i>Applying knowledge and understanding</i> <ul style="list-style-type: none"> ○ knows the theoretical basis of cytology, histology, organography and plant reproduction • <i>Autonomy of judgment</i> <ul style="list-style-type: none"> ○ can assess their own potential and limitations and work towards improvement • <i>Communicating knowledge and understanding</i> <ul style="list-style-type: none"> ○ can transfer the theoretical concepts learned to the laboratory activities and has the ability to effectively communicate the knowledge acquired from the study of plant biology, even with the help of modern communication systems • <i>Communication skills</i> <ul style="list-style-type: none"> ○ can evaluate the cytological, histological, and anatomical difference of the different organs of tracheophytes • <i>Capacities to continue learning</i> <ul style="list-style-type: none"> ○ Assessment of progress against baseline levels
<p>Criteria for assessment and attribution of the final mark</p>	<p>The final evaluation is expressed in thirtieths, as reported in the Didactic Regulation of the Degree Course in Agricultural Sciences and Technologies (art. 9) and in the study plan (attachment A).</p> <p>The exemption consists of a written test in which the student will have two hours to answer multiple-choice and open-ended questions on topics related to the first 30 hours of the course. The test consists of 30 multiple-choice and open-ended questions: 1 point for each correct answer, 0 points for each incorrect or no answer. The student, who correctly answers at least 18 questions, passes the test and is "eligible". The written exemption test is passed with a grade of at least 18/30.</p> <p>The final exam consists of an oral test on the topics developed during the theoretical and theoretical-practical lessons of both modules of the Integrated Course. The final evaluation of the exam will be expressed as the arithmetic average of all the tests of the two modules. The test is passed with a mark of at least 18/30.</p>
<p>Additional information</p>	



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