

Main course information	
Academic subject	Plants as functional foods
Degree course	Master's degree in Biosanitary Sciences
Classe di laurea	LM-6
ECTS credits (CFU)	4 CFU Lectures
Compulsory attendance	Yes
Teaching language	Italian
Accademic Year	2020/2021

Docente responsabile	
Name & Surname	Costantino Paciolla
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Tel.	080-5443557
Tutorial time/day	Monday, Wednesday and Friday 1,00-13,00 or by appointment

Course details	Pass-fail exam/Exam with mark out of 30	SSD code	Type of class
	Exam with mark out of 30	BIO/04	Lecture

Teaching schedule	Year	Semester
	I	II

Modalità erogazione	CFU/ECTS	Lessons (hours)	CFU/ECTS lab	Lab hours	CFU/ECTS tutorial/workshop	Tutorial/workshop hours	CFU/ECTS field trip	Field trip Hours
	4	32	0	0	0	0	0	0

Time management	Total hours	Teaching hours	Self-study hours
	100	32	68

Academic Calendar	First lesson	Final lesson
	First week of March 2021	First week of June 2021

Syllabus	
Course entry requirements	Knowledge of General Botany and Plant Physiology
Expected learning outcomes (according to Dublin Descriptors) (it is recommended that they are congruent with the learning outcomes contained in A4a, A4b, A4c tables of the SUA-CdS)	
<i>Knowledge and understanding</i>	Acquisition of knowledge of plant biology with particular reference to bioactive plant metabolites.
<i>Applying knowledge and understanding</i>	Acquisition of advanced knowledge regarding plant components with nutritional value. Ability to define the biological characteristics of secondary plant metabolites. Advanced knowledge on the bioactive capacities of plant cell components.
<i>Making informed judgements and choices</i>	Autonomy in the description, use and application of the main bioactive components of the plant field. Autonomy in the use and application of experimental protocols on plant matrices. Ability to know how to choose and apply the most appropriate methodology in plant studies.
<i>Communicating knowledge and understanding</i>	Ability to explain the acquired knowledge in a clear and exhaustive way. Acquisition of a lexicon and appropriate terminology related to the specific plant discipline.

Capacities to continue learning	<p>Acquisition of skills in the organization of one's work in the laboratory and in the critical capacity of the results obtained.</p> <p>Understanding the potential of plant systems for useful use for human and animal health.</p> <p>Consultation of bibliographic and site information will allow to be always updated about new knowledge and development of the discipline.</p>
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Syllabus

Course content	<p>Lectures</p> <p>Concept of functional food Definition, specificity, characteristics of functional food. Notes on current legislation.</p> <p>The compartments of the plant cell where deposits of substances of nutritional value are stored Photosynthate accumulation sites. Plastids as a source of sugars. Presence of sucrose and starch in plants.</p> <p>Cell wall and fruit ripening Remodeling and restructuring of the cell wall during fruit ripening. Fruit formation (tomato and apple model). Cell wall and dietary fiber. Classification of dietary fiber and their importance in the prevention of some human diseases.</p> <p>Seeds with nutritional value Seeds with lipid reserves. Accumulation of storage proteins. Storage proteins in legumes. Quality control of storage proteins (leguminous model). Classification of storage and phytate proteins in the Gramineae (wheat and maize model). Biotechnological improvement of storage proteins and other nutritional components of seeds for food purposes. Vacuoles as site of accumulation of secondary metabolites. Origin of secondary metabolism. Definition and classification of secondary metabolites. Bioactive terpenes: definition, classification and main terpenes showing biological activity. Phenolic compounds with bioactive value: definition, classification and main classes of phenols. Phytoestrogens. Isoflavones, psoralens, salicylic acid and human health. Alkaloids as bioactive metabolites: classification and their main properties. Importance of plant antioxidants in the human diet. Carotenoids (provitamin A and antioxidants) tocopherol (vitamin E). Vegetable micronutrients. Anti-nutritional components. Glycoproteins considered anti-nutritional components. Vegetable lectins: classification and characteristics of vegetable lectins. Phytohemagglutinin I: peculiarity and phytotoxicity of PHAI.</p>
Course books/Bibliography	<p>Lecture notes</p> <p>Recommended book Biochimica e Biologia Molecolare delle Piante - Buchanan Bob B., Gruissem W., Russell L.J., ZANICHELLI; Metabolismo Vegetale - Tennis DT., Turpin DH., Lefebre DD., Layzell DB., CALDERINI EDAGRICOLE; Fisiologia Vegetale - Taiz L., Zeiger E., PICCIN</p>
Notes	Lecture Power Points are available as support to the study.
Teaching methods	Lectures with the use of PowerPoint.

<p>Assessment methods (indicate at least the type written, oral, other)</p>	<p>Oral exam. The exam includes three oral questions concerning lectures. The evaluation expresses sufficiency with the vote of 18/30. The maximum vote is 30/30.</p> <p>POINTS:</p> <p>Null 1-6</p> <p>Seriously insufficient 7-12</p> <p>Insufficient 12-17</p> <p>Sufficient 18-21</p> <p>Good 22-24</p> <p>Very good 25-27</p> <p>Excellent 28-30</p> <p>The attribution of “30 cum laude” takes place in exceptional cases in which the student, having obtained the maximum possible evaluation within the pre-established parameters, presents further or extraordinary merits (e.g. clear and brilliant exposition, further details), emerged during the exam.</p>
<p>Evaluation criteria (Explain for each expected learning outcome what a student has to know, or is able to do, and how many levels of achievement there are)</p>	<p>Learning of the theoretical contents performed throughout the course.</p> <p>Acquisition of specialist terminology related to the specific plant discipline. The appropriate level of communication skills will be assessed during lectures and the final oral exam.</p>
<p>Further information</p>	