

General information	
Academic subject	<b>Vegetable crops (Module of Vegetable crops and Organic agriculture)</b>
Degree course	<b>Master degree in Agricultural and Environmental Science (LM69)</b>
Academic Year	2021-2022
European Credit Transfer and Accumulation System (ECTS)	6
Language	Italian (English will be used when required for foreign students into didactic material)
Academic calendar (starting and ending date)	September 27, 2021 - January 21, 2022
Attendance	Not mandatory

Professor/ Lecturer	
Name and Surname	Pietro Santamaria
E-mail	pietro.santamaria@uniba.it
Telephone	080-5443098
Department and address	Agricultural and environmental science
Virtual headquarters	M. Teams
Tutoring (time and day)	Every day by email

Syllabus	
<b>Learning Objectives</b>	The course aims to provide the student with a high level of knowledge on the techniques of production and enhancement of the main vegetable species in respect of the environment and food safety. For each species (tomato, artichoke, potato, lettuce, cauliflower and broccoli) it will be able to assess the influence of environmental and agronomic factors on the quantitative and qualitative aspects of production. At the end of the course, the student will know the general principles and characteristics of the main cultivated vegetables, "minor" vegetables, Apulian landraces and wild species, with a view to safeguarding and enhancing plant biodiversity.
<b>Course prerequisites</b>	"Agronomy" and "Vegetable and floriculture crops" requests for admission to the Master course.
<b>Contents</b>	<ul style="list-style-type: none"> <li>○ Presentation of the course: Contents, objectives and methods of carrying out the course. Biodiversity of vegetable crops. Micro-vegetables (1.5 ECTS, 8 h lectures + 7 h Lab &amp; field cl.)</li> <li>○ Local varieties. Nitrogen, vegetable quality and environment (1.5 ECTS, 8 lectures + 7 h Lab &amp; field cl.)</li> <li>○ Artichoke, cauliflower, broccoli, lettuce and leafy vegetables, early potato, tomato, visits to production and / or experimental companies (3 ECTS, 16 lectures + 14 h Lab &amp; field cl.)</li> </ul>
<b>Books and bibliography</b>	Pardossi A., Gianquinto Prosdociami G., Santamaria P., Incrocci L., Orticoltura. Principi e pratica (a cura di). Edagricole - New Business Media, Milano, 2018.
<b>Additional materials</b>	<ul style="list-style-type: none"> <li>○ Lecture notes provided by the teacher.</li> <li>○ Technical reports and scientific articles.</li> </ul>

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			
	<p>During the health emergency imposed by the COVID-19 pandemic, lectures will be held remotely with the use of M. Teams.</p> <p>The topics of the course will be treated with the help of Power Point presentations and with the support of videos. Students will receive the pdf format of the frontal lesson with the addition of useful texts for their study to the images. Each lesson (ppt and pdf) will be enriched with curiosities, links, insights, exercises to be carried out and questions for self-verification.</p> <p>The activities of exercises will develop in the greenhouse (but also at home for those who want it) the production of microgreens, to be carried out also in groups.</p> <p>Laboratory activities, technical visits in the field and in leading companies will be carried out.</p>		
Expected learning outcomes			
<b>Knowledge and understanding on:</b>	<ul style="list-style-type: none"> <li>○ the characteristics that distinguish the agrobiodiversity of Apulian vegetable species;</li> <li>○ international, national and regional laws for the protection of vegetable biodiversity;</li> <li>○ the EU regulation governing the maximum nitrate content for the marketing of vegetables;</li> <li>○ the Nitrates Directive, nitrate vulnerable zones and good agricultural practices;</li> <li>○ the cultivation technique of artichoke, cauliflower, broccoli, lettuce, tomato and early potato.</li> </ul>		
<b>Applying knowledge and understanding on:</b>	<ul style="list-style-type: none"> <li>○ work to ensure that vegetables have a lower nitrate content and their production is ecologically sustainable;</li> <li>○ planning the production of vegetables by improving quality, yield, shelf life and marketing;</li> <li>○ analyze the different situations of a production and market context, to plan actions and manage interventions to improve the quality and efficiency of vegetable productions, also in terms of sustainability, agrobiodiversity and eco-compatibility;</li> <li>○ register local varieties in the register of conservation varieties;</li> <li>○ propose the registration of traditional agri-food products in the national list.</li> </ul>		
<b>Soft skills</b>	<ul style="list-style-type: none"> <li>• <i>Making informed judgments and choices</i> <ul style="list-style-type: none"> <li>○ develop activities for the recovery, characterization and conservation of biodiversity, also through multidisciplinary team work and with reference to the territory in which it resides;</li> <li>○ know the problems related to the quality of the seeds thanks to the activities carried out in the laboratory;</li> <li>○ collect information and draw up an application for the inclusion of a traditional agri-food product in the relative national list thanks to the lessons on agrobiodiversity;</li> <li>○ independently produce microgreens.</li> </ul> </li> <li>• <i>Communicating knowledge and understanding</i> <ul style="list-style-type: none"> <li>○ develop technical reports;</li> </ul> </li> </ul>		

	<ul style="list-style-type: none"> <li>○ communicate information on the topics covered in class;</li> <li>○ offer ideas, problems and solutions to specialist and non-specialist interlocutors starting from the critical examination of the proposed case studies (on agrobiodiversity, the production of microgreens and the main vegetable crops) and the means of communication shown in class.</li> </ul> <ul style="list-style-type: none"> <li>● <i>Capacities to continue learning</i> <ul style="list-style-type: none"> <li>○ use the technical reports, scientific articles and links to research projects in progress or completed, provided with the teaching material, to continue the study autonomously over the course of life.</li> </ul> </li> </ul>
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<b>Assessment and feedback</b>	
Methods of assessment	<p>For students enrolled in the course year in which the teaching is carried out, an intermediate evaluation test (called exemption) is provided, which consists of an oral test on the topics developed during the first part of the course (biodiversity, local varieties and nitrates). Alternatively, he / she can present the result of a case study, assigned by the teacher on the student's proposal, on a local variety or on a biodiversity itinerary of agricultural and food interest. The outcome of this test contributes to the evaluation of the final exam and is valid for one academic year. The exam consists of an oral test on the topics developed during class hours. The evaluation of the student's preparation takes place on the basis of pre-established criteria, as detailed in the Didactic Regulations of the Master's Degree Course. Two questions will be asked, one on the first part of the teaching course and the other on the special part. For students who have taken the intermediate evaluation test (called exemption), the evaluation of the final exam is expressed taking into account the mark acquired with the exemption test not as an arithmetic average but as a weighted weight with respect to the program subject of the first test.</p> <p>In assigning the final grade, the theoretical and practical knowledge acquired, the ability to apply the aforementioned knowledge, the autonomy of judgment, the communication skills and the ability to integrate the knowledge acquired, the knowledge of one's own territory will be taken into account.</p>
Evaluation criteria	<ul style="list-style-type: none"> <li>● <i>Knowledge and understanding</i> <ul style="list-style-type: none"> <li>○ biodiversity in horticulture;</li> <li>○ nitrate content in vegetables;</li> <li>○ impact of nitrogen fertilization on the environment and production;</li> <li>○ production of the main horticultural species.</li> </ul> </li> <li>● <i>Applying knowledge and understanding</i> <ul style="list-style-type: none"> <li>○ register local varieties in the register of conservation varieties;</li> <li>○ propose the registration of traditional agri-food products in the national list.</li> <li>○ analyze the different situations of a production and market context, to plan actions and manage interventions to improve the quality and efficiency of horticultural productions, also in terms of sustainability, agrobiodiversity and eco-compatibility.</li> </ul> </li> <li>● <i>Autonomy of judgment</i></li> </ul>

	<ul style="list-style-type: none"> <li>○ develop activities for the recovery, characterization and conservation of biodiversity, also through multidisciplinary team work and with reference to the territory in which it resides;</li> <li>○ know the problems related to the quality of the seeds thanks to the activities carried out in the laboratory;</li> <li>○ collect information and draw up an application for the inclusion of a traditional agri-food product in the relative national list thanks to the lessons on agrobiodiversity;</li> <li>○ independently produce edible seedlings; conduct the crop cycle of the horticultural species studied.</li> <li>● <i>Communication skills</i> <ul style="list-style-type: none"> <li>○ mastery of matter and language.</li> </ul> </li> <li>● <i>Capacities to continue learning</i> <ul style="list-style-type: none"> <li>○ demonstration of having acquired all the arguments;</li> <li>○ development of problem analysis and argument structure.</li> </ul> </li> </ul>
Criteria for assessment and attribution of the final mark	<p>The evaluation of the students' tests takes place on the basis of pre-established criteria which include:</p> <ol style="list-style-type: none"> <li>a) consistency with the topics of the program,</li> <li>b) the quality of the processing,</li> <li>c) the ability to analyze,</li> <li>d) the level of structure of the arguments.</li> </ol> <p>The measure of the performance follows the following scheme</p> <p>Grade: 30 or 30 with honors: Excellent preparation, high level of knowledge, absolute mastery of the subject and of the language. Demonstration of having acquired all the arguments at a high level. Excellence in developing problem analysis and argument structure.</p> <p>Rating: 27-29: Accurate preparation, excellent level of knowledge, good command of the subject and language. Demonstration of having assimilated all the topics at a good level. Good ability to analyze problems and structure arguments</p> <p>Rating: 23-26: Satisfactory preparation, fair level of knowledge, fair mastery of the subject and language. Demonstration of having understood all the arguments. Fair ability to analyze problems and structure arguments.</p> <p>Rating: 18-22: Sufficient preparation, level of knowledge adequate to the minimum level of requests, sufficient mastery of the subject and language</p> <p>Acceptable ability to analyze problems and structure arguments.</p>
<b>Additional information</b>	
	Students will be invited to participate in research activities conducted in relation to research projects on the biodiversity of horticultural species in Puglia and on soilless crops.