

<b>General Information</b>	
Academic subject	Post-harvest pathology and Mycotoxicology
Degree course	Bachelor Courses 'Agricultural Science and Technology', and 'Agro-forestry environmental science and technology'
Curriculum	
ECTS credits	6
Compulsory attendance	No
Language	Italian

<b>Subject teacher</b>	<b>Name Surname</b>	<b>Mail address</b>	<b>SSD</b>
	Rita Milvia De Miccolis Angelini	ritamilvia.demiccolisangelini@uniba.it	AGR12

<b>ECTS credits details</b>			<b>ETCs</b>
Basic teaching activities	Free-choice subject		6

<b>Class schedule</b>	
Period	Second semester
Year	Third year
Type of class	Lectures, 4 ECTS (32 hours) Laboratory, field classroom, and case studies, 2 ECTS (28 hours) E-learning using public (eg Teams) platform can be used.

<b>Time management</b>	
Hours	150
In-class study hours	60 (32 Lectures + 28 Lab & field cl.)
Out-of-class study hours	90

<b>Academic calendar</b>	
Class begins	March 1 <sup>st</sup> , 2021
Class ends	June 11 <sup>th</sup> , 2021

<b>Syllabus</b>	
Prerequisites/requirements	Basic knowledge on plant biology
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)	<p><i>Knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Knowledge and understanding of the main features of biotic and abiotic postharvest diseases of fruits and vegetables</li> <li>○ Knowledge and understanding of control strategies, tools, and methods to reduce qualitative and quantitative losses of products during postharvest</li> <li>○ Knowledge and understanding of origin, toxic effects, detection methods, regulations, and strategies to prevent mycotoxin contamination of food and animal feed.</li> </ul> <p><i>Applying knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Basic knowledge and understanding for identification of diseases and causal agents of postharvest decay of fruits and vegetables.</li> <li>○ Ability to set up suitable management strategies for prevention and control of biotic and abiotic postharvest diseases.</li> <li>○ Ability to identify high risk situations for mycotoxin contamination and their management in an environmental and food safety and security perspective</li> </ul> <p><i>Making informed judgements and choices</i></p> <ul style="list-style-type: none"> <li>○ Ability to obtain new knowledge and identify and suggest appropriate solutions to avoid postharvest spoilage due to biotic and abiotic stresses and risks associated to mycotoxin contaminations of food and feed</li> </ul> <p><i>Communicating knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Ability of describing biotic and abiotic diseases affecting products during postharvest, the predisposing factors and appropriate control strategies.</li> <li>○ Ability of describing mycotoxins and evaluate risks associated with their</li> </ul>

	<p>presence in food and possible strategies for its prevention.</p> <p><i>Capacities to continue learning</i></p> <ul style="list-style-type: none"> <li>○ Capacities of updating and analyze the knowledge on postharvest diseases, mycotoxins and innovative strategies for their management.</li> </ul> <p>The results of the expected learning, in term of knowledge and ability, are listed in the Annex A of the Didactic Regulation of the Bachelor Course (expressed by the European descriptors of the study title).</p>
Contents	<ul style="list-style-type: none"> <li>• Presentation of the course and brief history of the postharvest pathology; storage, food safety and losses during postharvest. Symptom observation and diagnostic tools for postharvest diseases. Environmental and nutritional requirements of microorganisms responsible for postharvest decay.</li> <li>• Plant defence mechanisms and genetic resistance, Field and postharvest measures to prevent contamination of fruits and vegetables. Chemical, physical, and biological tools and application techniques for integrated postharvest disease management.</li> <li>• Major postharvest diseases of citrus fruits, pome and stone fruits, grapes, soft fruits and berries (strawberry, kiwifruit, etc.).</li> <li>• Introduction to mycotoxins. Mycotoxin production, chemical and biological properties. Toxicity and classification of mycotoxins. Sampling procedure for mycotoxin detection. Detection and identification of mycotoxigenic fungi. Risk evaluation and management. Factors affecting mycotoxin production. Regulations relating to mycotoxins. Control methods.</li> <li>• Aflatoxins, fusariotoxins, ochratoxins patulin, Alternaria toxins, tremorgenic mycotoxins, citrinin, penicillic acid, gliotoxin, ergot alkaloids.</li> </ul>
<b>Course program</b>	
Bibliography	<ul style="list-style-type: none"> <li>• V. De Cicco, P. Bertolini, M.G. Salerno, 2009. "Patologia Postraccolta dei Prodotti Vegetali", Piccin Editore.</li> <li>• Barkai-Golan R. (2001) Postharvest Diseases of Fruits and Vegetables: development and control, Elsevier, Londra.</li> <li>• Dov Prusky, Gullino M. L. (2014). Post-harvest Pathology, Springer.</li> <li>• Snowdon A.L. (1990) A Color Atlas of Post-harvest diseases &amp; disorder of fruit and vegetables, Volume 1 (General introduction and fruits) and Volume 2 (Vegetables). Wolfe Scientific ed., London.</li> <li>• Personal notes of the lectures and didactic materials distributed during the course.</li> </ul>
Notes	<p><b>Examples of websites</b></p> <p><a href="http://www.fao.org/home/en/">http://www.fao.org/home/en/</a>  <a href="http://www.efsa.europa.eu/en/topics/topic/mycotoxins">http://www.efsa.europa.eu/en/topics/topic/mycotoxins</a>  <a href="https://eur-lex.europa.eu">https://eur-lex.europa.eu</a>  <a href="http://tfrec.cahnr.wsu.edu/postharvest-export/postharvest-diseases/">http://tfrec.cahnr.wsu.edu/postharvest-export/postharvest-diseases/</a></p> <p>Further materials as research articles and websites will be provided on request.</p>
Teaching methods	<p>Oral presentations supported by Power Point slides, web sites and multimedia, documents prepared by the teacher, practical exercises in the classroom, in the laboratory and in the fields and guided visits in farms.</p>
Assessment methods (indicate at least the type written, oral, other)	<p>Only the students enrolled in the academic year during which this discipline is offered, can have an intermediary exam during the teaching period of the discipline. The result of this intermediary exam remains valid for the whole academic year and concurs to the final evaluation of the student.</p> <p>The intermediary exam will be given on the subjects treated during the lessons and the practical activities as reported in the Didactic Regulation of the Bachelor course (art. 9) and syllabus (annex A) and which is correlated to the actual teaching period. The evaluation of the intermediary exam is expressed in thirtieths.</p> <p>At the end of the module teaching period, the students, who passed positively the intermediary exam, can give the final exam concerning on the subjects treated during the lessons and the practical activities since the intermediary exam, as reported in the Didactic Regulation of the Bachelor Course (art. 9) and</p>

	<p>syllabus (annex A) and which is correlated to the actual teaching period. Students who did not pass or give the intermediary exam will be examined on the whole subjects treated during the lessons and the practical activities as reported in the Didactic Regulation of the Bachelor course (art. 9) and syllabus (annex A) and which is correlated to the actual teaching period.</p> <p>The intermediary and the final exams consist of an oral test. The evaluation of the student is based on criteria previously fixed such as reported in the Annex A of the Didactic Regulation in Agricultural Sciences and Technology and Agroforestry environmental science and technology.</p> <p>The exam for foreign students can be given in English according to the above reported modalities.</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>	<ul style="list-style-type: none"> <li>• <i>Knowledge and comprehension ability</i> <ul style="list-style-type: none"> <li>○ Ability to describe basic concepts of postharvest pathology and mycotoxicology, and strategies for management of postharvest diseases and mycotoxin contamination and to provide a detailed description of major postharvest diseases and mycotoxins.</li> </ul> </li> <li>• <i>Knowledge and applied comprehension ability</i> <ul style="list-style-type: none"> <li>○ Ability to recognize biotic and abiotic postharvest diseases.</li> <li>○ Knowledge about major mycotoxins that may contaminate food and animal feed.</li> <li>○ Ability to propose prevention and control actions against postharvest diseases and mycotoxin contamination of food.</li> </ul> </li> <li>• <i>Autonomy of judgement</i> <ul style="list-style-type: none"> <li>○ Ability to formulate reasonable hypotheses on prevention and control of major postharvest diseases and risk management for mycotoxins</li> <li>○ Ability to adapt general roles to specific products and situations.</li> </ul> </li> <li>• <i>Communication skills</i> <ul style="list-style-type: none"> <li>○ Ability to explain in exhaustive way, with appropriate words, richness of conceptual connections and examples, the main causes of post-harvest losses and quality deterioration of products also by mycotoxins, factors affecting harmfulness and their management.</li> </ul> </li> <li>• <i>Learning ability</i> <ul style="list-style-type: none"> <li>○ Ability to apply acquired knowledge and skills for problem solving in various operative situations.</li> </ul> </li> </ul>
<p>Further information</p>	<p><b>Visiting hours</b>  From Monday to Wednesday, 9.00 to 13.30 or in the afternoon following an established appointment requested to the teacher (by phone, e-mail, or Teams).</p>