

<b>General Information</b>	
Academic subject	General Plant Pathology I
Degree course	Bachelor Course Agricultural Sciences and Technologies
Curriculum	Plant Production and Crop Protection
ECTS credits	6
Compulsory attendance	No
Language	Italian

<b>Subject teacher</b>	Name Surname	Mail address	SSD
	Francesco Faretra	francesco.faretra@uniba.it	AGR12

<b>ECTS credits details</b>			
Basic teaching activities	Plant Protection disciplines		

<b>Class schedule</b>	
Period	First semester
Year	Third year
Type of class	Lectures-workshops

<b>Time management</b>	
Hours	150
In-class study hours	60
Out-of-class study hours	90

<b>Academic calendar</b>	
Class begins	2 <sup>nd</sup> october 2017
Class ends	26 <sup>th</sup> january 2018

<b>Syllabus</b>	
Prerequisites/requirements	Basic knowledge of 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 diseases, symptomatology, plant-pathogen interactions, disease epidemiology, diagnosis and basic principles of plant protection.</li> <li>○ Knowledge and understanding of the taxonomy and main biological characteristics of phytopathogenic fungi.</li> </ul> <p><i>Applying knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Knowledge and understanding for defining a diagnostic approach in the field and/or in the laboratory.</li> <li>○ Basic knowledge and understanding for identification and sustainable management of fungal diseases.</li> </ul> <p><i>Making informed judgements and choices</i></p> <ul style="list-style-type: none"> <li>○ Ability to understand the phenomena underlying the diseases, their spreading and harmfulness and their sustainable management.</li> <li>○ Ability to understand the biological characteristics of the main taxonomic groups of phytopathogenic fungi.</li> </ul> <p><i>Communicating knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Ability of describing the biological phenomena underlying plant diseases, their spreading and harmfulness.</li> </ul>

	<ul style="list-style-type: none"> <li>○ Ability of describing the main diagnostic methodologies applied to plant diseases.</li> <li>○ Ability of describing the main biological characteristics of phytopathogenic fungi and the disease typologies they cause.</li> </ul> <p><i>Capacities to continue learning</i></p> <ul style="list-style-type: none"> <li>○ Capacities of updating the knowledge on the characteristics of different plant diseases with emphasis on those caused by phytopathogenic fungi and on sustainable plant protection.</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	<p>Presentation of the course; brief history of Plant Pathology; definition of disease and their economic importance; classification of plant diseases; evaluation of disease severity and yield losses.</p> <p>Morpho-functional alterations in infected plants (alterations of plants morphology, of plant cells and tissues, organs falling out, blight and wilting, gum and resin emission, pathogen sporifications, alterations of photosynthesis, respiration, carbohydrate transport, phenolic metabolism, water balance).</p> <p>Disease epidemiology (influence of environment on disease development, disease pyramid, factor related to environment, host, pathogen, crop management practices, etc., favoring the development of epidemics; epidemis forecasting).</p> <p>Biotic causal agents of plant diseases: fungi, bacteria, viruses, viroids and phytoplasmas. Abiotic factors: anomalous lighting conditions, water availability, thermal conditions, atmospheric composition, nutritional unbalances, wounds, cytotoxicity.</p> <p>The fungi and affine organisms: main taxonomic groups (Mucilaginous moulds, Oomycota, Chytridiomycota, Zygomycota, Ascomycota, Basidiomycota, Deuteromycota).</p> <p>Structure, ultra-structure and fungal growth: hyphae, cell wall and septa, cytoplasmic membrane and organelles. The growth: filamentous fungi, yeast-like and dimorphic species; apical growth, branching and fusion, hyphal modifications (cordons, rhizomorphs, stroma and sclerotia), the fungal colony. Fungal spores: differentiation, release, dispersal and germination.</p> <p>Hints on nutrition, primary and secondary metabolism, extracellular enzymes, external digestions and defense of growth media, mycotoxins. Influence of environmental factors on growth and reproduction: water, temperature, light, pH, oxygen and carbon dioxide. Hints on fungal genetics: sexuality, heterokaryosis and parasexuality, non-mendelian mechanisms; genome and genomics; biotechnological aspects. Hints on integrated protection of plants from diseases.</p> <p>Diagnosis of plant diseases (traditional biological, serologic and molecular methods). Koch's postulates.</p> <p>Basic techniques for isolation and growth of fungal pathogens. Macro- and microscopic observations of vegetative and reproductive structures of fungal species representative of the main taxonomic groups.</p> <p>Observations of phytopathological samples in the field and under laboratory conditions, identification of the main causal agents of</p>

	diseases, evaluation of yield losses, application of main diagnostic techniques.
<b>Course program</b>	
<b>Bibliography</b>	<ul style="list-style-type: none"> <li>• Personal notes of the lectures and teaching material distributed during the course.</li> <li>• Belli G. (2007). Elementi di Patologia Vegetale. Piccin Nuova Libreria, Padova.</li> <li>• Deacon J.W. (2001). Micologia moderna. Calderini Edagricole, Bologna.</li> </ul> <p><b>Additional readings</b></p> <ul style="list-style-type: none"> <li>• Matta A. (1996). Fondamenti di Patologia Vegetale. Patron editore.</li> <li>• Agrios G. (2005) Plant Pathology. 5th Edition. Academic Press, New York, USA.</li> <li>• Strange R. (2003) Introduction to Plant Pathology. Wiley.</li> <li>• Webster J., Weber R.W.S. (2008). Introduction to fungi. Cambridge University Press, Cambridge, UK.</li> <li>• Further materials will be provided on request by the teacher.</li> </ul>
<b>Notes</b>	<p><b>Examples of websites</b></p> <ul style="list-style-type: none"> <li>• <a href="http://erec.ifas.ufl.edu/plant_pathology_guidelines/index.shtml">http://erec.ifas.ufl.edu/plant_pathology_guidelines/index.shtml</a></li> <li>• <a href="http://issuu.com/scisoc/docs/43818/1">http://issuu.com/scisoc/docs/43818/1</a></li> <li>• <a href="http://ohioline.osu.edu/hyg-fact/3000/">http://ohioline.osu.edu/hyg-fact/3000/</a></li> <li>• <a href="http://www.apsnet.org/edcenter/">www.apsnet.org/edcenter/</a></li> <li>• <a href="http://www.dpvweb.net/index.php">www.dpvweb.net/index.php</a></li> <li>• <a href="http://subviral.med.uottawa.ca/pdf/class-viroids-ncbi.pdf">http://subviral.med.uottawa.ca/pdf/class-viroids-ncbi.pdf</a></li> <li>• <a href="http://plantpathology.ba.ars.usda.gov/phytoplasma.html">http://plantpathology.ba.ars.usda.gov/phytoplasma.html</a></li> <li>• <a href="http://www.atlasplantpathogenicbacteria.it/index.htm">www.atlasplantpathogenicbacteria.it/index.htm</a></li> <li>• <a href="http://www.fungionline.org.uk">www.fungionline.org.uk</a></li> <li>• <a href="http://www.britmycolsoc.org.uk">www.britmycolsoc.org.uk</a></li> <li>• <a href="http://www.world-of-fungi.org">www.world-of-fungi.org</a></li> <li>• <a href="http://www.mycobank.org">www.mycobank.org</a></li> <li>• <a href="http://www.rogersmushrooms.com/default.asp">www.rogersmushrooms.com/default.asp</a></li> <li>• <a href="http://www.cbs.knaw.nl">www.cbs.knaw.nl</a></li> <li>• <a href="http://www.mycology.net">www.mycology.net</a></li> <li>• <a href="http://www.aspergillus.org.uk">www.aspergillus.org.uk</a></li> </ul>
<b>Teaching methods</b>	Oral presentation supported by Power Point slides, web sites and multimedia, by the usage of blackboard, documents prepared by the teacher and practical exercises in the classroom and in the laboratory.
<b>Assessment methods (indicate at least the type written, oral, other)</b>	<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 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 Plant Medicine.</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 causes, symptomatology, plant-pathogen interactions, epidemiology and diagnosis of diseases.</li> <li>○ Ability to describe the biological characteristics of the main taxonomic groups of phytopathogenic fungi.</li> </ul> </li> <li>• <i>Knowledge and applied comprehension ability</i> <ul style="list-style-type: none"> <li>○ Ability to define appropriate diagnostic approaches in the field and in the laboratory for different cases.</li> <li>○ Ability to recognize different disease typologies and to propose basic actions for their control.</li> </ul> </li> <li>• <i>Autonomy of judgement</i> <ul style="list-style-type: none"> <li>○ Ability to formulate hypotheses on the procedures of diagnosis and control of plant diseases.</li> <li>○ Ability to describe the main characteristics and life cycles of the main taxonomic groups of phytopathogenic fungi.</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, aetiology, aetiology, symptomatology, epidemiology, diagnosis and basic management of plant diseases as well as the biological characteristics of the main phytopathogenic fungi.</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 frames.</li> </ul> </li> </ul>
<p>Further information</p>	<p><b>Visiting hours</b>  From Monday to Wednesday, 9.00 to 13.30 following an established appointment requested by phone or e-mail.</p>