

## COURSE OUTLINE

### 1. GENERAL

<b>SCHOOL</b>	AGRICULTURAL SCIENCES		
<b>ACADEMIC UNIT</b>	AGRICULTURE		
<b>LEVEL OF STUDIES</b>	UNDERGRADUATE		
<b>COURSE CODE</b>	AGR_504	<b>SEMESTER OF STUDIES</b>	FIFTH
<b>COURSE TITLE</b>	Plant Pathology		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>
Lectures		3	
Laboratory exercises		2	
<b>Total</b>		<b>5</b>	<b>5</b>
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	Mandatory, special background, specialised general knowledge, skills development		
<b>PREREQUISITE COURSES:</b>	Typically, there are no prerequisite courses.		
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek. The course may be given in English in case foreign student follow.		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	Yes		
<b>COURSE WEBPAGE (URL)</b>			

### 2. LEARNING OUTCOMES

<p><b>Learning outcomes</b> <i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i> <i>Consult Appendix A</i></p> <ul style="list-style-type: none"> <li>• <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i></li> <li>• <i>Descriptors for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i></li> <li>• <i>Guidelines for writing Learning Outcomes</i></li> </ul>
<p>At the end of this course the student will further develop the following skills:</p> <ol style="list-style-type: none"> <li>1. Understand the meaning and importance of Plant Pathology in general as well as the importance of plant diseases in plant protection and their impact on agriculture and the general economic and social activities of humans.</li> <li>2. Understand concepts and specific definitions of Plant Pathology</li> <li>3. Be able to identify plant diseases according to their causal agent, and to make correct diagnosis of the pathogen</li> <li>4. Be competent in choosing the right strategy for dealing with plant diseases in relation to food safety and offering alternatives.</li> <li>5. Will have the opportunity to know how to gather information on cutting edge issues related to proper management of diseases and food safety.</li> <li>6. Will be familiar with basic laboratory techniques of Plant Pathology (processing of fresh samples of diseased plants [study of symptoms, stereoscopy, microscope], diagnostic procedure).</li> </ol>
<p><b>General Competences</b> <i>Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?</i></p>

<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>
<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>
<i>Decision-making</i>	<i>Respect for the natural environment</i>
<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>
<i>Team work</i>	<i>Criticism and self-criticism</i>
<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>
<i>Working in an interdisciplinary environment</i>	<i>.....</i>
<i>Production of new research ideas</i>	<i>Others...</i>
	<i>.....</i>

Generally, by the end of this course the student will, furthermore, have develop the following general abilities (from the list above):

*Decision making*  
*Autonomous (Independent) work*  
*Team work*  
*Respect for the Environment*  
*Promotion of free, creative and inductive thinking*

### 3. SYLLABUS

1. Purpose, significance and history of Plant Pathology. Concept of Disease
2. Disease Symptoms
3. Disease Signs
4. Basics of Plant Fungal Diseases
  - o Morphology of True Fungi and Oomycetes
  - o Reproduction of True Fungi and Oomycetes
  - o Classification of True Fungi and Oomycetes
  - o The most important plant pathogenic genera and species of True Fungi and Oomycetes
5. Basics of Plant Bacterial Diseases
  - o Morphology & Reproduction of Bacteria
  - o Classification of Bacteria
  - o The most important plant pathogenic bacterial genera and species
  - o Bacterial Survival & Dispersion
  - o Symptoms of plant bacteriological diseases
  - o Bacterial pathogenesis
  - o Plant Bacteria control strategies
  - o Basics of phytoplasma and spiroplasma diseases
6. Basics of Plant Virology
  - o Virus Morphology
  - o Multiplication of viruses in host cells
  - o Reproduction of Viruses
  - o Virus classification
  - o The most important plant pathogenic viruses
  - o Symptoms of plant viral diseases
  - o Virus transmission
  - o Identifying Plant Viruses
  - o Plant virus control strategies
  - o Basic knowledge about viroids
7. Plant diseases caused by parasitic higher plants, invasive climbing plants and parasitic green algae
  - o Non-parasitic plant diseases
  - o Extreme temperatures
  - o Nutrient deficits and toxicities
  - o Phytotoxic pollutants in the atmosphere
8. Mechanisms of Pathogenesis
9. Plant defense
10. The Immune System of Plants

11. The Quartet of Plant Diseases.
12. Principles and Methods of Diagnosis of Plant Diseases
13. Principles and Methods of Plant Disease control

Laboratory exercises:

1. Health and safety rules in the laboratory.
2. Principles of plant disease study.
3. Description and microscopy study of mycelia and specialized spores and fruiting bodies of fungi.
4. Stereoscopy and microscopy study, identification and classification of major plant pathogenic fungi (Oomycetes, Ascomycetes Basidiomycetes and Adelomycetes)
5. Identification of symptoms, signs and causal agents of important plant diseases (downy mildew, mildew, rust, etc.).
6. Processing of fresh plant samples with fungal, bacteriological, virological and non - parasitic diseases.

#### 4. TEACHING AND LEARNING METHODS - EVALUATION

<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	Lectures in class and laboratory exercises in the lab, face to face.	
<b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of Information and Communication Technologies (ICTs) (e.g. powerpoint) in teaching. The contents of the course of each chapter are uploaded on the internet, in the form of a series of pdf files that the students can freely download using a password which is provided to them at the beginning of the course.	
<b>TEACHING METHODS</b> <i>The manner and methods of teaching are described in detail.</i>  <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i>  <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	<b>Δραστηριότητα</b>	<b>Φόρτος Εργασίας Εξαμήνου</b>
	Lectures (3 contact hours per week x 13 weeks)	39
	Laboratory work (2 contact hours per week x 6 weeks)	12
	Assignment	12
	Hours for private study of the student, preparation and attendance mid-term or/and final examinations.	62
	<b>Total number of hours for the Course (25 hours of work-load per ECTS credit)</b>	<b>125 hours (total student work-load)</b>
<b>STUDENT PERFORMANCE EVALUATION</b> <i>Description of the evaluation procedure</i>  <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i>  <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	<ol style="list-style-type: none"> <li>1. Mandatory written examination, with full length questions and / or multiple choice questions, as well as questions based on the laboratory work. Minimum pass grade= 5, scale 0-10. Total degree contribution 80%.</li> <li>2. Mandatory assignment, maximum evaluation degree = 2. Total degree contribution 20%.</li> <li>3. Final degree = sum 1+2.</li> <li>4. All the above are taking place in Greek and/or in English in case foreign student follow.</li> </ol>	

## **5. RECOMMENDED LITERATURE**

*Suggested bibliography:*

1. Agrios G. N. Plant Pathology 5<sup>th</sup> Edition. 2015. Academic Press.

*- Related academic journals:*

1. Journal of Plant Pathology. International journal edited by the Italian Phytopathological Society. Springer.
2. Plant Pathology. International journal edited by the British Society for Plant Pathology. Wiley.