PLANT PATHOLOGY AND POSTHARVEST MANAGEMENT OF FRUITS AND VEGETABLES
COURSE OUTLINE

1. GENERAL

SCHOOL	SCHOOL OF AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF FOOD SCIENCE AND NUTRITION		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	ΓΠ616	**SEMESTER OF STUDIES**	6th
COURSE TITLE	**PLANT PATHOLOGY AND POSTHARVEST MANAGEMENT OF FRUITS AND VEGETABLES** Course coordinator: Evangelia Tigka		
INDEPENDENT TEACHING ACTIVITIES *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*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures		3	5
Laboratory exercises		2	
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialisation		
PREREQUISITE COURSES:	–		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (IN ENGLISH)		
COURSE WEBSITE (URL)			

2. LEARNING OUTCOMES

Learning outcomes
At the end of this course the student will have further developed the following skills. The student will: 1. Understand the concept and importance of Plant Pathology in general, as well as the importance of plant diseases in plant protection and their impact on agriculture and on wider human economic and social activities. 2. Understand the concepts and specialised definitions of Plant Pathology. 3. Distinguish plant diseases according to their causal agent and make correct diagnoses of infections in various plant species, as well as of postharvest diseases. 4. Select the right management strategy for plant diseases and for postharvest diseases of fruits and vegetables in storage facilities, with regard to food safety, and propose alternative solutions. 5. Know how to keep up to date on current issues concerning the proper management of diseases and food

safety.

General competences

More generally, on completing this course the student will have developed:

- Search for, analysis and synthesis of data and information, using the appropriate technologies.
- Decision-making and problem solving.
- Working independently and in teams.
- Adapting to new situations.
- Respect for the natural environment and the principles of sustainable development.
- Promotion of free, creative and critical thinking.

3. SYLLABUS

Week 1:
Introduction to Plant Pathology. Aims, importance and basic concepts of Plant Pathology. The concept and expression of disease. Biotic and abiotic causes of disease. Interaction of host, pathogen and environment.

Week 2:
Symptomatology and semiology of plant diseases. Disease symptoms and signs. Disorders of growth and morphogenesis, changes in natural colour, chlorosis, necrosis, rots, wilts, abnormal secretions and shedding of plant organs.

Week 3:
Basic principles of Plant Pathogenic Mycology. Morphology, reproduction and classification of fungi and oomycetes. Survival and dispersal. The most important plant pathogenic genera and species. Symptoms of fungal diseases.

Week 4:
Basic principles of Plant Pathogenic Prokaryotes. Morphology, reproduction and classification of plant pathogenic bacteria. Survival, dispersal, infection and pathogenesis. Symptoms of bacterial diseases. Phytoplasmas and spiroplasmas.

Week 5:
Basic principles of Plant Virology. Morphology and basic characteristics of plant viruses. Entry and replication in host cells, movement and transmission. Symptoms of viral diseases. Basic principles of detection and identification. Plant viroids.

Week 6:
Parasitic flowering plants. Non-parasitic diseases and physiological disorders. Extreme temperatures, nutrient deficiencies, toxicities, disturbances in water availability and transport, and phytotoxic pollutants.

Week 7:
Nutritional dependence and life cycle of infectious pathogens. Sources of inoculum, survival and dispersal of pathogens, infection, colonisation and the disease cycle.

Week 8:
Mechanisms of pathogenesis, defence and recognition in host–pathogen interactions. Chemical weapons of pathogenesis. Passive (pre-existing) and active (induced) defence mechanisms. Hypersensitive response, induced systemic resistance and systemic acquired resistance. The plant innate immune system.

Week 9:
Basic principles of the Epidemiology of plant diseases. The disease triangle and the disease tetrahedron. Monocyclic and polycyclic diseases. Effect of host, pathogen and environmental conditions on the occurrence and development of diseases.

Week 10:
Principles and methods of Diagnostic Plant Pathology. Clinical and laboratory diagnosis. Observation of

symptoms and signs, sampling and basic principles of isolation, detection and identification of plant pathogens.

Week 11:
Principles and methods of plant disease management. Preventive and cultural measures; physical, biological and chemical control. Resistant varieties and principles of integrated disease management.

Week 12:
Representative diseases of cultivated plants. Selected diseases of important fruit trees and vegetable crops. Causal agent, symptomatology, epidemiology, diagnosis and management.

Week 13:
Main postharvest diseases of fruits and vegetables. Postharvest diseases of important fruit and vegetable crops. Diagnosis, and preharvest and postharvest management. Mycotoxigenic fungi and human pathogenic microorganisms in fresh and ready-to-eat plant products.

4. TEACHING and LEARNING METHODS – EVALUATION

DELIVERY	Face-to-face teaching combining lectures, laboratory exercises, case studies, problem solving and collaborative activities. Theoretical teaching is supported by photographic and audiovisual material on plant pathological and postharvest diseases. Real examples of infected plant products are used to develop skills in symptom recognition, differential diagnosis, risk assessment and selection of appropriate prevention and management measures. The laboratory exercises apply inquiry-based and experiential learning through observation of macroscopic and microscopic features, examination of plant material, recognition of disease symptoms and signs, basic diagnostic techniques and the study of postharvest deterioration of fruits and vegetables.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Use of computers, presentations, educational videos, digital photographic material and the e-class platform for distributing teaching material, communication, submission of assignments and provision of feedback. Use of interactive questions and short online self-assessment quizzes, as well as digital activities on recognising symptoms from images and solving short clinical/diagnostic case studies.
TEACHING ORGANISATION	

Activity	***Semester workload***
Lectures	39
Study and analysis of bibliography	25
Writing of assignments	14
Independent study	37
Participation in examinations	10
Course total (25 hours of workload per credit)	**125**

STUDENT PERFORMANCE EVALUATION	**1. Written examination (60%)** Essay and/or multiple-choice questions, as well as questions based on the theory and on the laboratory exercises. **2. Laboratory assessment (20%)** Recognition of disease symptoms and signs and basic diagnostic applications.

	3. Assignment – disease portfolio (20%) Group assignment with a presentation of selected plant pathological or postharvest diseases. The final grade is the sum of the above assessments. Assessment is carried out in Greek and, for Erasmus students, in English.

5. ATTACHED BIBLIOGRAPHY

Suggested bibliography (in Greek):

1. Agrios G. N. Plant Pathology [Φυτοπαθολογία]. 2015. 1st Greek edition – 5th American edition. UTOPIA Publications. (Greek translation of Agrios G. N., Plant Pathology, 5th ed., Elsevier Academic Press, 2005.)
2. Gravanis F. Plant Pathology [Φυτοπαθολογία]. 2018. COPY CITY P.C.
3. Iliopoulos A. G. General Plant Pathology [Γενική Φυτοπαθολογία]. 2004. Stylianos Vasileiadis Publications.
4. Tzamos E. Plant Pathology [Φυτοπαθολογία]. 2017. 2nd edition. UNIBOOKS P.C.