SYLLABUS (MODULE-ERASMUS+)

Course/module (as specified in the approved curriculum for the field of study) **Aspects of Plant Diseases**	ECTS **4**	Catalogue number HORT 3.2
Name in Polish **Aspekty Chorób Roślin**		
Heads of course/module **Assoc. Prof. Lidia Irzykowska, Assoc. Prof. Zbigniew Karolewski /. Assoc. Prof. Iwona Morkunas,**		
Unit(-s) providing the course/module (Institute/Department) **Department of Phytopathology, Seed Science and Technology/ Department of Plant Physiology**		

Field of study	Level	Profile	Semester
Horticulture (Phytopathology) **Biology (Plant Physiology)**		**Academic-general**	**Winter**

TYPE OF CLASSES/LECTURES AND THE NUMBER OF HOURS
(organised classes/lectures and self-study)

Type of studies: full-time		Type of studies: extramural	
- lectures	**15**	- lectures	
- practical total	**15**	- classes	
- laboratory practical		-	
- project based practical		-	
- Other – tutored	**5**	-	
- self-study	**65**	- Self-study	
Total number of hours:	**100**	Total number of hours:	

OBJECTIVE OF COURSE/MODULE

Presentation of pathogens with diverse lifestyles and strategies of plant pathogenesis. Presentation of co-evolution of virulence factors and plant hosts. The program also includes a presentation of distinct defence responses of plants depending on the lifestyle of the attacker encountered. The program includes a presentation of plant disease epidemiology- meaning and importance, factors affecting plant disease epidemics – host, pathogen, environment and time factor.

TEACHING METHODS

Lecture supported by multimedia presentation, discussion, practical exercise, microscopic observations, laboratory training consisting of performing of experimental tasks independently, observation/evaluation of disease symptoms on model plants under the supervision of a teacher, written work related to the summary of results (team or individual).

LEARNING OUTCOMES		Reference to field outcomes	Reference to area outcomes
Knowledge	E1. Student has a knowledge of the taxonomy and morphology of pathogenic fungi E2. Student knows the main factors influencing pathogenesis process E3. Student characterizes the fungal lifestyle, the substrate and nutrients and knows the main ways through which fungi obtain their nutrition E4. Student describes life cycles of pathogens on selected examples E5. Student has a knowledge concerning the activation of distinct plant defence responses depending on the lifestyle of the fungal pathogens E6. Student has a knowledge concerning important roles of fungi in diverse ecosystems E7. Student has a knowledge of epidemiology of plant diseases		

Skills	E8. Student identifies main groups of pathogenic fungi based on their morphological features E9. Student recognises symptoms of diseases related to pathogen mode of action E10. Student identifies fungal pathogens and their lifestyle and diseases E11. Student recognises plant defence responses depending on the lifestyle of fungal pathogens E12. Student recognises elements of the epidemic and their interaction		
Social competences	E13. Student is able to work as a leader and/or as a partner in a group E14. Student is able to assess the different influence of fungal pathogens on the natural environment surrounding people E15. Student is able to predict the effects on different environmental stressors on food quality and understand the economic significance of the subject nowadays		

Methods to verify learning outcomes	Outcome Reference Numbers
Written test	E1-E7
The preparation of oral presentation	E8-E12
Discussion	E13-E15

TEACHING CONTENT

Content of lectures:

1. Introduction to fungi kingdom. Pathogenesis process. The role of enzymes, toxins, growth regulators and polysaccharides in pathogenesis. (L. Irzykowska)
2. Fungal pathogens and their lifestyle and disease. The classification of pathogenic fungi into the nutrition, growth and development. The effects of pathogens on their hosts. How pathogens attack plants. Induction of defence mechanisms in plants. Genetic variation in pathogens and their hosts: co-evolution of a disease system (I. Morkunas)
3. Introduction to epidemics of plant diseases. Types of plant diseases epidemics. Role of pathogens, environment and host son epidemics development. (Z. Karolewski)

Content of exercises:

1. Fungal morphology. Taxonomic features of different fungal pathogens. Macroscopic and microscopic diagnostics of plant disease symptoms. Koch's postulate. (L. Irzykowska)
2. Evaluation of the development of infection and diseases caused by pathogens of varying lifestyles. Tests on the effects of defense metabolites on the development of pathogens with diverse lifestyles. Effect of various external factors on pathogen virulence (I. Morkunas)
3. The use of volumetric spore trap in monitoring of plant diseases. An assessment of progress on plant diseases development (Z. Karolewski)

Forms and criteria for passing of course/module	Percentage of final mark
Written test – passed above 60%	100%

LIST OF LITERATURE

Webster J., Weber W.S. 2007. Introduction to fungi. Third edition. Cambridge University Press.
Lucas J.A.2002. Plant Pathology and Plant Pathogens. Third edition. Reprint. Blackwell Publishing.
Purchase I.F.H. (ed.) 1974. Mycotoxins. Elseviere Scientific Publishing Company
Jennings, D.H. & Lysek, G. 1999.Fungal Biology: understanding the fungal lifestyle, 2nd edn. Bios, Oxford.
Agrios G.N. 1997. Plant Pathology. Fourth edition. Academic Press, San Diego, USA
B.M. Cooke, D. Gareth Jones, Bernard Kaye (eds.) The Epidemiology of Plant Diseases.