SYLLABUS (MODULE-ERASMUS+)

Course/module (as specified in the approved curriculum for the field of study) **Seed diseases and pests**	ECTS **6**	Catalogue number HORT 6.2
Name in Polish **Choroby i szkodniki nasion**		
Head of course/module **dr. Dorota Szopińska**		
Unit(-s) providing the course/module (Institute/Department) **Department of Phytopathology, Seed Science and Technology**		

Field of study **Horticulture**	Level **II – master studies**	Profile **Akademic-general**	Semester **summer**

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	25	- lectures	
- practical total	35	- classes	
- laboratory practical	25	-	
- project based practical	10	-	
- Other – tutored	15	-	
- self-study	90	- Self-study	
Total number of hours:	150	Total number of hours:	

OBJECTIVE OF COURSE/MODULE

To acquaint a student with seed and seed-borne diseases and their causing factors, both infectious and non-infectious, their importance, methods of detection and control. To develop skills of using gained knowledge in the production of healthy seeds and seed storage.

TEACHING METHODS

Lectures, laboratory classes, written reports

	LEARNING OUTCOMES	Reference to field outcomes	Reference to area outcomes
Knowledge	E1. Student knows seed-borne and seed diseases caused by infectious and non-infectious factors and understands their importance. E2. Student knows basic legal regulations defining the principles of production and trade of healthy seeds. E3. Student has knowledge about the methods of healthy seed production and methods of detecting fungi, bacteria, viruses and nematodes associated with seeds. E4. Student knows the principles of seed protection against fungi and pests during storage.	O2A_W05 O2A_W06 O2A_W07 O2A_W11	R2A_W05 R2A_W03 R2A_W04 R2A_W06 R2A_W03 R2A_W04 R2A_W05 R2A_W06 R2A_W03 R2A_W04 R2A_W05
Skills	E5. Student has skills of searching, understanding, analyzing and using information on seed health testing, seed treatment, production of healthy seeds and seed storage. E6. Student is able to select a method and perform seed health analysis, recognizes pathogens and makes a decision on handling seeds depending on results obtained.	O2A_U01 O2A_U03 O2A_U05 O2A_U07 O2A_U08 O2A_U10	R2A_U01 R2A_U04 R2A_U05 R2A_U03 R2A_U06 R2A_U07 R2A_U10
Social competences	E7. Student is aware of importance of social, professional and ethical responsibility for production of healthy seeds and condition of natural environment. E8. Student is able to define properly priorities leading to accomplishment of a task. Student is able to cooperate and work in a team. E9. Student is prepared for participation in teams, organisations and	O2A_K02 O2A_K03 O2A_K05 O2A_K06	R2A_K02 R2A_K03 R2A_K03 R2A_K05 R2A_K04 R2A_K06

Methods to verify learning outcomes	Outcome Reference Numbers
- test, exam	E1, E2, E3, E4
- evaluation of performance and analysis of the results of experiments, evaluation of identifying fungi associated with the seeds, evaluation of the plan, realization and execution of the project	E5, E6
- evaluation of the presentation and discussion	E7, E8, E9

TEACHING CONTENT

Content of lectures: The role of seeds in transmission of plant diseases**.** Location of the pathogens in/on seeds. Seed diseases. Principles of seed crop protection against seed-transmitted pathogens. Seed treatment. Seed health testing methods. Principles of protection of stored seeds against fungi and pests.

Content of exercises: Learning seed health testing methods. Detection and identification of fungi commonly associated with seeds. Determination of location of fungi in the seeds. Demonstrating efficacy of seed treatment.

Project: Development of a strategy of handling seeds of selected plant species depending on the results of seed health testing.

Forms and criteria for passing of course/module	Percentage of final mark
Written exam	70
Practical (recognition of fungi associated with seeds, knowledge of seed-borne pathogens)	30

LIST OF LITERATURE

Basic literature

Agarwal V.K., Sinclair J.B., 1997. Principles of Seed Pathology. CRC, Boca Raton.

http://seedtest.org/en/download-ista-seed-health-testing-methods-_content---1--1132--746.html

http://www.worldseed/org/isf/ishi_vegetable.html

Langerak C.J., van den Bulk R.W., Franken A.A.J.M., 1996. Indexing Seeds for Pathogens. In: Advances in Botanical Research, 23: 171-215.

Machado J.C., Langerak C.J., Jaccoud-Filho D.S., 2002. Seed-borne Fungi: A Contribution to Routine Seed Health Analysis. ISTA Basserdorf.

Mathur S.B., Kongsdal O., 2003. Common Laboratory Seed Health Testing Methods for Detecting Fungi. ISTA, Basserdorf.

Maude R.B., 1996. Seedborne Diseases and their Control. CAB International, Wallingford.

Neergaard P., 1979. Seed Pathology. The Macmillan Press Ltd., London and Basingstoke.

Richardson M.J., 1990. An Annotated List of Seed-borne Diseases. ISTA, Zurich.

Taylor E., Bates J., Jaccoud D., 2006. Diagnosis of Seedborne Pathogens. W: Handbook of Seed Science and Technology (ed. Basra A.S.). Food Product Press. New York, London, Oxford: 649-676.