SYLLABUS (MODULE-ERASMUS+)

Course/module (as specified in the approved curriculum for the field of study) **Physio-chemical soil properties**	ECTS **2**	Catalogue number HORT 3.3
Name in Polish **Właściwości fizyko-chemiczne gleby**		
Head of course/module **Dr hab. Tomasz Kleiber**		
Unit(-s) providing the course/module (Institute/Department) **Department of Plant Nutrition**		

Field of study **Horticulture**	Level	Profile **Academic-general**	Semester **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		- lectures	
- practical total		- classes	
- laboratory practical	25	-	
- project based practical		-	
- Other – tutored		-	
- self-study	25	- Self-study	
Total number of hours:	50	Total number of hours:	

OBJECTIVE OF COURSE/MODULE

Educate students about the physical and chemical soil properties to provide optimal growth and development conditions for plants

TEACHING METHODS

- laboratory experiments, demonstrations,
- multimedia presentation,
- sample calculations,
- discussion.

	LEARNING OUTCOMES	Reference to field outcomes	Reference to area outcomes
Knowledge	- E1 Student has knowledge about the role and significance of the natural environment, the usefulness of soils and the directions of their development	1AK_W08	R1A_W06
Skills	- E2 Student has the ability to evaluate the value of soils, their correct use	1AK_U06	R1A_U06
	- E3 Student has the ability to determine the effect of nutrients on the growth and yielding of plants and the selection of the optimal fertilizers and dates of their application	M1A_U09	R1A_U05
	- E4 Student has the ability to carry out a research task under the guidance of a scientific supervisor on the determination of the physical and chemical properties of the soil	1AK_U09	R1A_U04
	- E5 Student prepares guidelines for performing controlled plant nutrition based on chemical analyzes of soil, soil and plants	M1A_U10	R1A_U06

Social competences	- E6 is aware of the importance of professional and ethical responsibility for the reliability of the analysis and interpretation of results	1AK_K07	R1A_K05
	- E7 Student is able to work in a group.	Z2A_K04	R2A_K02

Methods to verify learning outcomes	Outcome Reference Numbers
- Test	E1, E2, E3, E4, E5, E6
- Assessment of activity during exercise	E3, E4, E7
- Assessment of performance and analysis of observation or experiment results and formulation of conclusions	E4

TEACHING CONTENT

Content of lectures:
Content of exercises:

Investigation of:

1) physical properties of soil:
   - determination of mechanical composition,
   - determination of density and porosity.

2) chemical properties of soil:
   - determination of soil sorption capacity and saturation of the sorption complex (Kappen method),
   - determination of soil acidity and content of carbonates (by Scheibler method) and salinity,
   - determination of soil chemical composition (universal method – mod. Spurway's methods).

Modification of soil chemical composition:
- Knowledge about the assortment and identify the fertilizers,
- application of fertilizers.

Project:

Forms and criteria for passing of course/module	Percentage of final mark
Writing tests	100%

LIST OF LITERATURE

Basic literature

- Phogat V.K., Tomar V.S., Dahiya R. 2015. *Soil Physical Properties*
- Barker A.V., Pilbeam D.J. 2006. *Handbook of Plant Nutrition*; Taylor & Francis
- Articles from scientific journals
- Breś W., Golcz A., Kozik E. Komosa A. 2012. *Żywienie roślin ogrodniczych; Podstawy i perspektywy*. Red. Nauk. A. Komosa. PWRiL Poznań
- Dobrzański B., Zawadzki S. 1997. *Gleboznawstwo*. PWRiL wydanie IV, Warszawa, 1997