

Course name: Sustainable horticulture systems

ECTS	4
Course status	<i>facultative</i>
Course final assessment /evaluation of outcomes	The grade based on Student's work
Prerequisite	basics of soil science, plant cultivation and nutrition

Main field of study:**Agriculture and Horticulture, Biology and Biotechnology (Erasmus+)**

Educational profile	<i>general academic</i>
Code of studies and education level	<i>bachelor/engineer (SI) or master of science (SM)</i>
Semester of studies	<i>summer or winter</i>
Language of instruction	<i>English</i>

Course offered by:

Name of faculty offering the course	Faculty of Biotechnology and Horticulture
Name of department offering the course	Department of Plant Biology and Biotechnology
Course coordinator	Agnieszka Lis-Krzyżcin Ph.D., D.Sc.

Learning outcomes:

Symbol of outcome	Description of the learning outcome	Reference to main field of study outcomes	Area symbol*
KNOWLEDGE – student knows and understands:			
SHS_W1	principles, concepts and techniques of organic and sustainable production of crops and can explain the difference between biodynamic, organic and integrating farming systems	EPB2_W03 OGR1_W03-06	R
SHS_W2	the methods of limiting the harmful effects of agriculture	EPB2_W03 OGR1_W03-06	R
SHS_W3	development and soil and water management in sustainable horticulture systems	EPB2_W03 OGR1_W03-06	R
SHS_W4	agronomic practices affecting plant crop (tillage, crop rotation, fertilization, irrigation, weed control, etc.) as well as cite organic and inorganic fertilizers	EPB2_W03 OGR1_W03-06	R
SHS_W5	the process of analysis of plant nutrient requirements, types of inorganic and organic fertilizers and strategy of their usage	EPB2_W03 OGR1_W03-06	R
SHS_W6	the effect of agronomic practices on food quality and safety and the decorative value of ornamental plants	EPB2_W03 OGR1_W03-06	R
SKILLS – student is able to:			
SHS_U1	take soil and plant material samples for analysis	EPB2_U01 EPB2_U06 OGR1_U03 OGR1_U07	R
SHS_U2	assess the basic chemical properties of the soil (soil pH, EC, nutrient concentration) and the content of organic matter and interpret the obtained results	EPB2_U01 EPB2_U06 OGR1_U03 OGR1_U07	R
SHS_U3	determine selected nutrients in plant material and interpret the results of the analysis	EPB2_U01 EPB2_U06 OGR1_U03 OGR1_U07	R
SHS_U4	determine the dose and form of mineral fertilizers for the physico-chemical properties of the soil and the nutritional requirements of the plant	EPB2_U01 EPB2_U06 OGR1_U03	R

		OGR1_U07	
SHS_U5	explain the nutritional value of fruits and vegetables and the decorative value of ornamental plants.	EPB2_U01 EPB2_U06 OGR1_U03 OGR1_U07	R
SOCIAL COMPETENCIES – student is ready to:			
SHS_K1	work individually and in a team, respect their own work and the work of others. Takes responsibility for group tasks	EPB2_K02 OGR1_K03	R
SHS_K2	assess the risk and environmental, economic and social effects of the known farming systems	EPB2_K04 OGR1_K03	R
SHS_K3	take responsibility and assess the responsibility of agricultural producers for the quality and safety of produced plant materials	EPB2_K05 OGR1_K03	R

Teaching contents

Lectures		20 hours
Topics	Sustainable agriculture – concepts, principles, challenges. Farming systems: biodynamic, integrating and organic. Inorganic and organic fertilizers and application strategies. The environmental factors affecting horticulture plant crop. Agrotechnical factors – tillage, crop rotation, irrigation. Soil quality and fertility management. Plant nutrient requirements. Food quality and safety (from field to table). Decorative value of ornamental plants. Environmental sounds of agricultural practice.	
Accomplished learning outcomes		SHS_W1-W6, SHS_K2
Means of verification, rules and criteria of assessment		test, presentation (50% share in the final assessment)
Classes:		10 hours
Topics	Soil sampling. Methods of assessing physical soil properties (texture, structure, water capacity, density) Chemical analysis of soil (organic matter, macro- and microelements, pH, EC) Plant material analysis (dry matter, macro- and microelements) Interpretation of soil and plant analysis results. Interpretation of physic-chemical analysis results. Determination of doses of inorganic fertilizers Field classes – a visit to the greenhouse horticulture farm.	
Accomplished learning outcomes		SHS_U1-U5, SHS_K1-K3
Means of verification, rules and criteria of assessment		problem task, class reports (50% share in the final assessment)

References:

Basic	Marshner P. 2012. Marshner's Mineral Nutrition of Higher Plants. Academic Press Ltd
	Barker A.V., Pilbeam D.J. 2015. Handbook of Plant Nutrition. CRC Press
Supplementary	Lægneid M., Bøckman O.C., Kaarstad O. 1999. Agriculture, Fertilizers and the Environment. CABI Publish.
	Krishna K.R. 2002. Soil Fertility and Crop Production. Science Publishers Inc.

Structure of learning outcomes

Area of academic study: R – Agricultural, forestry and veterinary sciences	4,0 ECTS **
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Structure of student activity

Contact hours	40	hrs.	1.6 ECTS**
Including: lectures	20	hrs.	

classes and seminars	10	hrs.		
consultations	5	hrs.		
participation in research	...	hrs.		
obligatory traineeships	...	hrs.		
participation in examination	5	hrs.		
e-learning	...	hrs.	ECTS**
student own work	60	hrs.	2.4	ECTS**

*Areas of academic study in the fields of: H- humanities; S - social studies; P – biological sciences; T – technological sciences; M- medical, sport and health sciences; R – Agricultural, forestry and veterinary sciences; A – the arts

** stated with an accuracy to 0.1 ECTS, where 1 ECTS = 25 - 30 hours of classes