

**Course name***Plant Ecology*

ECTS	3
Course status	<i>facultative</i>
Course final assessment /evaluation of outcomes	<i>exam</i>
Prerequisite	<i>basic knowledge of plant biology and botanics</i>

**Main field of study:***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</i>
Language of instruction	<i>English</i>

**Course offered by:**

Name of faculty offering the course	Faculty of Agricultural and Economics
Name of department offering the course	Department of Plant Breeding, Physiology and Seed Science
Course coordinator	Prof. Dr hab. inż. Marcin Rapacz

**Learning outcomes**

Symbol of outcome	Description of the learning outcome	Reference to main field of study outcomes	Area symbol
KNOWLEDGE – student knows and understands:			
PE_W1	relationships between plants and the environment and between plant organisms in a habitat, as well as threats to plant communities arising from human activities		P,R
PE_W2	basic ecological processes involving plants and vegetation		P,R
PE_W3	plant communities and indicator plant species		P,R
SKILLS – student is able to:			
PE_U1	interpret the transformation processes of vegetation units, and recognize plant communities on the basis of their biological characteristics		P,R
PE_U2	communities, and use indicator plants in environmental assessment		P,R
PE_U3	analyse the structure and function of organisms as an expression of adaptation to specific environmental conditions		P,R
PE_U4	use the Western-Blot technique		P,R
SOCIAL COMPETENCIES – student is ready to:			

PE_K1	work systematically in a team on the project		P,R
PE_K2	take care of the proper planning and execution of the tasks involved in carrying out a specific research project		P,R

### Teaching contents:

**Lectures** **15 hours**

Topics	Plant adaptations to environmental conditions. Physiological, biochemical and molecular adaptations.
	Variants of photosynthetic metabolism
	Plant adaptations to dry, humid, subpolar and mountainous conditions
	Population structure of vegetation, population structure, dynamics and demography
	Impact of climate change and human activities on phytocenosis structures, invasive and declining species
	Secondary metabolism of plants - ecological role
	Co-existence of plants with other organisms: interactions between plants of the same and other species, interactions between plants and herbivores (vertebrates and invertebrates) - role of other
	Phytocenosis as a structural and functional component of the ecosystem

means of verification, rules and	<i>Exam - open questions (60% participation in the final mark)</i>
----------------------------------	--

**Classess** **30 hours**

Topics	Field classes: General characterization of habitats with the help of indicator species, determination of the directions of vegetation changes in the studied habitats, the role of anthropopression, invasive species, preparation of phytosociological documentation, recognition of plant communities.
	Laboratory classes: Block 1. Determination of the photosynthetic type of selected plant species occurring in dry or swampy environments by determining the protein ratios of PEP carboxylase and RuDP carboxylase-oxygenase by Western Blot technique.
	Laboratory classes: Block. 2. the role of light in plant growth (measurements of chlorophyll content, photosystem II efficiency and fresh weight content of monocotyledonous type C3 (wheat), type C4 (maize) and dicotyledonous (oilseed rape) plants grown under intense and low light conditions; Demonstration of the effect of light on seed germination of photoblast-positive and negative plants; Observations of chloroplast movements in <i>Elodea canadensis</i> leaves under strong and weak light and darkness).

means of verification, rules and criteria of assessment	<i>Laboratory work reports from each segment of classes (40% participation in the final mark)</i>
---	---

### References:

Basic	Schulze E.D. "Plant Ecology", Springer Nature, 2019 Keddy P.A. "Plant Ecology: Origins, Processes, Consequences", Cambridge, 2017
Supplementary	Lenda, M., Steudel, B., Skórka, P., Zagrodzka, Z. B., Moroń, D., Bączek-Kwinta, R., ... & Knops, J. M. (2023). Multiple invasive species affect germination, growth, and Lenda, M., Skórka, P., Kuszewska, K., Moroń, D., Belcik, M., Bączek Kwinta, R., ... & Knops, J. M. (2021). Misinformation, internet honey trading and beekeepers drive a plant invasion. <i>Ecology Letters</i> , 24(2), 165-169.

### Structure of learning outcomes

Area of academic study: agriculture and horticulture	1,5	ECTS**
--	-----	--------

Area of academic study: biological sciences			1,5	ECTS**	
<b>Structure of student activity</b>					
Contact hours		48	hrs	1,9	ECTS**
Including	Lectures	15	hrs		
	classes and seminars	30	hrs		
	consultations	2	hrs		
	participation in research	...	hrs		
	obligatory traineeships	...	hrs		
	participation in examination	1	hrs		
e-learning		0	hrs	0	ECTS**
student own work		28	hrs	1,1	ECTS**

|

|



