University of Presov in Presov
Faculty of Humanities and Natural Sciences,
Department of Ecology

COURSE DESCRIPTION

Code: 2EKO/JEKOFY/15	**Title: Ecophysiology and Stress Plant Physiology**	
Field of study: 4.1.4 General ecology and ecology of individuals and populations **Study programme:** Ecology		
Guarantee:	**Lecturers:** RNDr. Daniela Gruľová, PhD.	
Semester: Summer	**Forms of teaching:** Lectures, seminars	**Number of credits:** 4
	Recommended number of hours: **Per week:** 2/1 **Total per study:** 26/13	
Prerequisites:		
Assessment: ongoing evaluation **Final assessment:** Credit evaluated based on preparation presentation on selected topic and physical participation at minimum 80 % of seminars.		
Learning outcomes: - The student has advanced knowledge of the relationship between plants and the environment. - The student is able to understand ecophysiological terminology and uses these technical terms fluently in discussions. - The student is able to practically evaluate the influence of exogenous factors on plant metabolism and can predict plant behavior. - He masters the main methods of experimental activity of ecophysiology, which he can also use independently.		

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Course content:

1. Introduction to Ecophysiology (Evolutionary view of Ecophysiology. What is Ecophysiology? Roots of Ecophysiology. Physiological ecology. Time frame of plant response to the environment as a consequence of evolutionary selection. Experimental approach.
2. Plant environment (atmosphere, hydrosphere, lithosphere and soil, phytosphere, chemical interactions.)
3. Carbon utilization (photosynthesis, respiration, plant gas exchange, plant carbon stock)
4. Dry matter production (transport of substances by phloem, problems of water transport in climbing plants)
5. Utilization of minerals (soil as a source of minerals, intake and storage of minerals, minerals in plant metabolism)
6. Mineral elimination and mineral cycle (cycle N, C ..)
7. Water relations (transport of water over long and short distances, lack and excess of water)
8. The influence of the environment on the growth and development of plants (regulation of growth and development, the influence of exogenous factors at different stages of development)
9. Plant phenology (plant development as an indicator of the nature of weather and climate change
10. Plants under stress and adaptation (disturbance and syndromes, dormancy and germination,)
11. Influence of extreme temperature, solar radiation and drought (effect of using free radicals before damage to plants at low temperatures, heat shock proteins, IR effect, UV effect, damage, global changes and future fertility, stress from salinization and excess of heavy metals)
12. Alelopathy and herbivore defense (chemical defense, secondary metabolites, predator strategies, mutualism, xenobiotic detoxification. Adaptations as a result of selection pressure.)
13. Ecosystem and global progress (decomposition, ecophysiological control)

Literature:

1. Opatrný, Z.2010. Rostliny a stes. PF-UK-Praha
2. Kováčik, J. 2012. Stresová fyziológia rastlín – návody na cvičenia.UPJŠ – Košice
3. Lambers, H. – Chapin, F.S. – Pons, T.L.2008. Plant Physiological Ecology. Second Edition: Springer.ISBN 978-0-387-78340-6
4. Larcher W.2003.Physiological Plant Ecology. Ecophysiology and Stress physiology on Functional Group. Fourth Edition by Springer. P.513. ISBN 978-3-540-43516-7

Language the course is taught in:	**Signature of guarantee and date of last edition:**
English	1st September 2019