



OPIS PREDMETA / SUBJECT SPECIFICATION

Predmet:	Ekofiziologija rastlin
Subject Title:	Plant Ecophysiology

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Biologija in ekologija z naravovarstvom /Biology and Ecology with Nature Conservation	Biologija / Biology	1	2

Univerzitetna koda predmeta / University subject code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Lab. work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
30	15		30	10	155	8

Nosilec predmeta / Lecturer:

Jeziki / Languages:	Predavanja / Lecture: Vaje / Tutorial:	slovenski / Slovenian slovenski / Slovenian
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Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Prerequisites:

Vsebina:

Contents (Syllabus outline):

Osnovni fiziološki procesi: fotosinteza, dihanje, transport asimilatov, sprejem vode, transpiracija, raba hranljivih snovi, rast, razmnoževanje, preživetje in razširjenost rastlin so odvisni od razmer v okolju in prilagojenosti rastlin na to okolje. Rastlinska ekofiziologija obravnava fiziološke procese rastlin in njihov pomen v prilagajanju na različne habitate. Pri tem gre za medsebojne vplive rastlin in njihovega fizikalnega, kemijskega in biotskega okolja. Ekofiziologija nam pomaga razumeti pomen značilnih lastnosti rastlin.

The basic physiological processes: photosynthesis, respiration, transport of photosynthates, water uptake, transpiration, nutrient acquisition, growth, reproduction, survival and adaptations in a given environment are influenced by environmental conditions and plant adaptations to its environment. Plant physiology describes physiological processes in plants and their significance for their life and in habitats. These processes are affected by the interactions between plants with their physical, chemical, and biotic environment. The ecophysiology helps us to understand the significance of specific plants traits.

Jedro predmeta obravnava fiziološke procese, ki uravnava sprejem ogljika, vode in hranljivih snovi pomembnih za rast, razmnoževanje in preživetje rastlin v različnih okoljih. Obravnavani so vplivi abiotičnih dejavnikov okolja na življenjski cikel rastlin, kot sta svetloba in temperatura, ter vpliv biotskih dejavnikov okolja na življenjski cikel rastlin, kot so simbiotske in parazitske asociacije, alelopatija, medsebojni vplivi rastlin, karnivorija, obramba pred rastlinojedci, povzročitelji bolezni, fiziologija stresa ter vloga rastlin v ekosistemih.

The course introduces to physiological processes, which regulate carbon, water, and nutrient balance and influencing plants growth, reproduction and their survival in different environments. It introduces the influence of abiotic environment on plant life cycle, light and temperature, as well as the influence of biotic environment on plant life cycle, symbiotic and parasitic associations, allelopathy, defiance against herbivores, pathogens, interactions among plants, carnivory, stress physiology and furthermore the role of plants in ecosystems.

Temeljni študijski viri / Textbooks:

- Larcher, W., 2003: Physiological Plant Ecology, 4. Edition. Springer Verlag, Berlin, Heidelberg.
- Lambers, H., S. F. Chapin, T. Pons, 1998: Plant Physiological Ecology. Springer Verlag, Berlin, Heidelberg.
- Sitte, P., E. W. Weiler, J. W. Kadereit, A. Bresinsky, C. Körner, 2002: Lehrbuch der Botanik. 35. Auflage. Spektrum Akademischer verlag Heidelberg, Berlin.
- Taiz, L., E. Zeiger, 2002: Plant Physiology. Sinauer Associates, Inc., Publishers, Sunderland, Massachusetts.

Cilji:

- Prepoznavanje in razumevanje fizioloških in ekoloških procesov in mehanizmov, ki vodijo v prilagajanje rastlin, izpostavljenih spremembam v okolju
- Prepoznavanje in razumevanje ekološkega vidika prilagoditev na nivoju cele rastline
- Razumevanje in prepoznavanje osnovnih fizioloških procesov, pomembnih za rastlinsko ekologijo, na osnovi citologije, morfologije, molekularne biologije, genetike, biokemije in biofizike
- Kritično raziskovanje ekoloških procesov in pojavov ter prepoznavanje biotskih in abiotskih dejavnikov in mehanizmov, ki vplivajo na rastline
Prepoznavanje vloge stresa pri rastlinah in vrednotenje pozitivne ali negativne vloge stresa pri rasti, razvoju, razmnoževanju, preživetju in adaptacijah

Predvideni študijski rezultati:

Znanje in razumevanje:

- Fiziološki procesi in mehanizmi, ki vodijo v prilagajanje rastlin, izpostavljenih spremembam v okolju
- Ekološki vidik prilagoditev na nivoju cele rastline
- Osnovni fiziološki procesi in pojavi, pomembni za rastline
- Biotski in abiotski dejavniki in mehanizmi, ki vplivajo na rastline
Vloga stresa pri rastlinah

Prenesljive/ključne spretnosti in drugi atributi:

- Osnovne spretnosti, pomembne za praktično eksperimentalno delo: opazovanje, merjenje, ravnanje z rastlinskim materialom, kemikalijami, steklovino, osnovnimi aparaturami, zbiranje rezultatov, načrtovanje poskusov, vrednotenje rezultatov, poročanje
- Seznanjanje z izbranimi laboratorijskimi in terenskimi metodami dela
- Varno delo v laboratoriju in na terenu

Metode poučevanja in učenja:

- Predavanja
- Laboratorijske vaje – individualno eksperimentalno delo

Objectives:

- Identification and understanding the physiological and ecological mechanisms that result in adjustment of plants exposed to changes in their environment.
- Identification and understanding the ecological consequences of modifications on the whole plant level.
- Identification and understanding physiological mechanisms and processes relevant to plant ecology on the basis of cytology, morphology, molecular biology, genetics, biochemistry and biophysics.
- Critical examination of plant ecological processes to identify the biotic and abiotic factors and mechanisms that influence plants. Recognition of the role and impact of stress on growth, development, reproduction, survival and adaptations of plants.

Intended learning outcomes:

Knowledge and Understanding:

- Physiological processes and mechanisms that result in adjustment of plants exposed to changes in their environment
- Ecological consequences of adjustment on the whole plant level
- Basic physiological mechanisms and phenomena relevant for plants
- Biotic and abiotic factors and mechanisms that influence plants
The role and impact of stress in plants

Transferable/Key Skills and other attributes:

- Basic skills important for practical experimental work: observations, measurements, manipulation with plant material, chemicals, glass wares and other equipments, collecting data, designing experiments, analyzing data, reporting
- Qualification for work with selected laboratory and field techniques
- Safe working practice in laboratory and field

Learning and teaching methods:

- Lectures
- Laboratory excersises – individual experimental practice

- Seminar
- Terensko delo

- Seminar
- Field work

Načini ocenjevanja:

Delež (v %) /
Weight (in %)

Assessment:

<ul style="list-style-type: none"> • Laboratorijski dnevnik in kolokvij iz vaj • Seminarska naloga • Pisni ali ustni izpit 	<p>25 25 50</p>	<ul style="list-style-type: none"> • Diary and partial exam of experimental practice • Seminar essay • Written or oral exam
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Materialni pogoji za izvedbo predmeta :

- *Multimedijska predavalnica*
Laboratorij za fiziologijo rastlin opremljen z osnovno laboratorijsko opremo: sušilnik, kuhalnik, plin, voda, pH-meter, tehnica, avtoklav, laminarij, spektrofotometer, mikroskop, rastna komora, steklovina in orodje

Material conditions for subject realization

- *Lecture hall for multimedia presentations*
Plant physiology laboratory equipped with selected laboratory equipment: cooker, gas, water, pH-meter, balance, dryer, autoclave, microscope, glass-wares and other equipments.

Obveznosti študentov:

- (pisni, ustni izpit, naloge, projekti)*
- Laboratorijski dnevnik
 - Kolokvij iz vaj
 - Seminarska naloga
 - Pisni ali ustni izpit

Students' commitments:

- (written, oral examination, coursework, projects):*
- Diary of experimental practice
 - Partial exam of experimental practice
 - Seminar essay
 - Written or oral exam