



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

| | |
|----------------------|--|
| Predmet: | Izbrana poglavja iz ekofiziologije živali |
| Course title: | Selected Topics in Animal Ecophysiology |

| Študijski program in stopnja Study programme and level | Študijska smer Study field | Letnik Academic year | Semester Semester |
|---|-------------------------------|-------------------------|--------------------------------|
| Doktorski študij Ekološke znanosti, 3. stopnja | | 1. ali 2.; 1st or 2nd | 1. 2. ali 3. ; 1st, 2nd or 3rd |
| Doctoral Study Ecological Sciences, 3rd degree | | | |

Vrsta predmeta / Course type

Univerzitetna koda predmeta / University course code:

| Predavanja Lectures | Seminar Seminar | Vaje Tutorial | Lab. vaje Laboratory work | Terenske vaje Field work | Samost. delo Individ. work | ECTS |
|------------------------|--------------------|------------------|------------------------------|-----------------------------|-------------------------------|------|
| 5 | | | 5 | | 140 | 5 |

Nosilec predmeta / Lecturer:

| | | |
|-------------------|-------------------------------|---------------------|
| Jeziki / | Predavanja / Lectures: | slovenski / slovene |
| Languages: | Vaje / Tutorial: | slovenski / slovene |

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Poznavanje ekofiziologije živali na ravni univerzitetnega programa

Prerequisites:

Knowledge of animal ecophysiology at graduate level

Vsebina:

Obravnavana so izbrana poglavja iz naslednjih sklopov.

- Notranje okolje: intracelularno in ekstracelularno okolje. Zunanje okolje: atmosfera, vodno in kopensko okolje
- Homeostaza in regulacijski mehanizmi: toleranca in rezistenca; aklimatizacija in aklimacija
- Energetika živali: sproščanje in pretvorbe energije, aerobna in anaerobna presnova
- Temperatura in termoregulacija. Hitrost reakcij.

Content (Syllabus outline):

Selected topics in the following chapters are discussed.

- Internal environment: intracellular and extracellular environment. External environment: atmosphere, aquatic and terrestrial environments
- Homeostasis and regulation: tolerance and resistance; acclimatization and acclimation
- Animal energetics: energy release and transformations; aerobic metabolism; anaerobic metabolism
- **Temperature and thermoregulation. Reaction**

Temperaturno okolje. Izmenjava toplote. Ektotermi, endotermi. (kaj pa poikilo- in hooeotermi?) Biokemijske adaptacije na določene temperature

- Čutila in okolje
- Dihanje: dihanje v vodnem okolju in na kopnem.
- Voda in telesne tekočine. Izločanje
- Prehrana in prebava. Vzorci prehranjevanja. Specializirani prebavni sistemi (celuloza, hitin, voski)

rates. Thermal environment. Heat exchange. Ectotherms, endotherms. Biochemical adaptations to specific temperatures

- **Sensory receptors and environment.**
- Aquatic respiration; aerial respiration
- Water and body fluids. Excretion
- Nutrition and digestion. Feeding patterns
- Specialized digestive systems (cellulose, chitin, wax)

Temeljni literatura in viri / Readings:

- Randall, D., W. Burggren, K. French, 2002: Eckert Animal Physiology. W. H. Freeman and Company, New York.
- Withers, P. C., 2002: Comparative Animal Physiology. Saunders College Publishing, Philadelphia, New York
- Schmidt-Nielsen, K., 2010: Animal physiology : adaptation and environment. Cambridge University Press. Cambridge .

Cilji in kompetence:

- Obravnavati zveze živalski organizem – zunanje okolje – notranje okolje na izbranih živalih
- Podrobno razumeti vpliv dejavnikov okolja na temeljne fiziološke procese
- Podrobno predstaviti fiziološke procese v izbranem živalskem organizmu

Objectives and competences:

- To discuss relations: animal organism – internal environment – external environment on selected animals
- Advanced understanding the influence of environmental factors on general physiological processes
- To present in detail physiological processes in selected animal organisms

Predvideni študijski rezultati:

Znanje in razumevanje:

- Podrobno razumevanje zvez živalski organizem – zunanje okolje – notranje okolje
- Podrobno razumevanje procesov metabolizma od celičnega nivoja do organizma.

Prenesljive/ključne spretnosti in drugi atributi:

- Sposobnost načrtovati zahtevne vrhunske eksperimente za testiranje odzivov živali na kontrolirane spremembe v njenem okolju
- Sposobnost ovrednotiti zahtevne rezultate fiziološkega poskusa

Intended learning outcomes:

Knowledge and Understanding:

- Advanced understanding of relations: animal organism – internal environment – external environment
- Advanced understanding of metabolic processes from cell to organismic level.

Transferable/Key Skills and other attributes:

- Ability to arrange exacting experiments testing responses of an animal to controlled changes of its environment
- Ability to evaluate results of an exacting experiment in animal physiology

Metode poučevanja in učenja:**Learning and teaching methods:**

- Predavanja
- Laboratorijske vaje – individualno eksperimentalno delo

- Lectures
- Laboratory excersises – individual experimental practice

Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

- Seminarska naloga
- Pisni izpit

50 %
50 %

- Seminar essay
- Written exam

Reference nosilca / Lecturer's references:

1. DEVETAK, Dušan. Effects of larval antlions *Euroleon nostras* (Neuroptera, Myrmeleontidae) and their pits on the escape-time of ants. *Physiological entomology*, ISSN 0307-6962, 2005, 30, str. 82-86, graf. prikazi. [COBISS.SI-ID [13844488](#)], [JCR, SNIP, WoS do 6. 5. 2014: št. citatov (TC): 8, čistih citatov (CI): 4, normirano št. čistih citatov (NC): 4, Scopus do 15. 4. 2014: št. citatov (TC): 8, čistih citatov (CI): 4, normirano št. čistih citatov (NC): 4]

2. DEVETAK, Dušan, MENCINGER VRAČKO, Bojana, ŠPERNJAK, Andreja, DEVETAK, Miha. Capture success in pit-building Antlion *Euroleon nostras* (Geoffroy in Fourcroy, 1785) (Neuroptera Myrmeleontidae) depends on the presence of pits, sand particle size and transmission of vibratory signals : a mini review. *Annali del museo civico di storia naturale di Ferrara*, ISSN 1127-4476, 2005 (2007), vol. 8, str. 161-165, ilustr. [COBISS.SI-ID [15271432](#)]

3. NOVAK, Tone, ŠAJNA, Nina, ANTOLINC, Estera, LIPOVŠEK DELAKORDA, Saška, DEVETAK, Dušan, JANŽEKOVIČ, Franc. Cold tolerance in terrestrial invertebrates inhabiting subterranean habitats. *International journal of speleology*, ISSN 0392-6672, 2014, vol. 43, no. 3, str. r39-r46. <http://dx.doi.org/10.5038/1827-806X.43.3.3>, doi: [10.5038/1827-806X.43.3.3](https://doi.org/10.5038/1827-806X.43.3.3). [COBISS.SI-ID [20595208](#)], [JCR, SNIP, Scopus do 28. 7. 2014: št. citatov (TC): 0, čistih citatov (CI): 0, normirano št. čistih citatov (NC): 0]