



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Fiziologija živali
Course title:	Animal Physiology

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Univerzitetni študijski program Ekologija z naravovarstvom, 1. stopnja		3.; 3rd	6.; 6th
Undergraduate university programme Ecology with Nature Conservation, 1st degree			

Vrsta predmeta / Course type Obvezni/Obligatory ali Izbirni/Elective

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
45			30		105	6

Nosilec predmeta / Lecturer: Dušan DEVETAK

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

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Potrebno je znanje fizike, kemije in splošne zoologije	Knowledge of Physics, Chemistry and General Zoology is required

Vsebina:

- Zunanje in notranje okolje.
- Energetika celice. Energetika organizma.
- Temperatura in termoregulacija.
- Fiziologija membran: od zgradbe membrane do živčne integracije.
- Senzorična fiziologija: čutila in zaznavanje okolja.
- Hormoni in endokrini sistem.
- Celično gibanje, mišice in gibanje živali.
- Živčevje in vedenje.
- Kri in krvožilje.
- Izmenjava plinov – dihanje.
- Ionsko in osmotsko ravnotežje.
- Prehrana in prebava.
- Organizacija vedenja in njegova raznolikost.
- Evolucija vedenja, adaptacij in komunikacije.
- Reprodukcijska in spolno vedenje.
- Predatorstvo.
- Prehranjevalno vedenje. Skrb za potomce.
- Socialno vedenje.

Content (Syllabus outline):

- External and internal environments.
- Cellular energetics. Animal energetics.
- Temperature and thermoregulation.
- Membrane physiology: from membrane structure to neural integration.
- Sensory physiology: sensory organs and sensing the environment.
- Hormones and endocrine system.
- Cell movement, muscles and animal movement.
- Nervous system and behaviour.
- Blood and circulation.
- Gas exchange – respiration.
- Ionic and osmotic balance.
- Feeding and digestion.
- Organisation of behaviour and its diversity.
- Evolution of behaviour, adaptations and communication.
- Reproduction, sexual behaviour. Predation. Feeding. Caring for offsprings. Social behaviour.

Temeljni literatura in viri / Readings:

Alcock, J., 2005: Animal behavior: an evolutionary approach. 8th ed. Freeman, Sunderland.

Randall, D., W. Burggren, K. French, 2002: Eckert Animal Physiology. 5th Edition. 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
- Pojasniti vlogo celičnih membran pri temeljnih fizioloških procesih
- Pojasniti integracijsko vlogo senzoričnega, hormonalnega in

Objectives and competences:

- To discuss relations: animal organism – internal environment – external environment
- To explain the role of cell membranes in general physiological processes
- To explain integrative role of sensory,

- živčnega sistema
- Predstaviti temeljne fiziološke procese v živalskem organizmu
 - Predstaviti raznolikost vzorcev vedenja in njegovo kompleksnost
 - Podati evolucijski pristop pri študiju vedenja živali

- hormonal and nervous system
- To present fundamental physiological processes in animal organisms.
 - To present diversity and complexity of behaviour.
 - To give an evolutionary approach to animal behaviour.

Predvideni študijski rezultati:

Znanje in razumevanje:

- Razumevanje zvez živalski organizem – zunanje okolje – notranje okolje
- Vlogo celičnih membran pri temeljnih fizioloških procesih
- Vloga integracijskih sistemov - senzoričnega, hormonalnega in živčnega sistema
- Osnovni procesi metabolizma od celičnega nivoja do mnogoceličnega organizma
- Kompleksnost vedenja živali

Prenesljive/ključne spretnosti in drugi atributi:

- Sposobnost načrtovati in izvesti preproste eksperimente za testiranje odzivov živali na kontrolirane spremembe v njenem okolju
- Sposobnost ovrednotiti rezultate fiziološkega in etološkega poskusa

Metode poučevanja in učenja:

- Predavanja
- Laboratorijske vaje – individualno eksperimentalno delo

Intended learning outcomes:

Knowledge and understanding:

- Understanding of relations: animal organism – internal environment – external environment
- The role of membranes in general physiological processes
- Integrative role of sensory system, hormonal and nervous systems
- Metabolic processes from cell to multicellular organism
- Complexity of animal behaviour

Transferable/Key Skills and other attributes:

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

Learning and teaching methods:

- Lectures
- Laboratory excersises – individual experimental practice

Načini ocenjevanja:

- Kolokvij in poročilo iz vaj
- Pisni izpit

Delež (v %) /

Weight (in %)

Assessment:

• Kolokvij in poročilo iz vaj	50	• Partial exam and report of experimental practice
• Pisni izpit	50	• Written exam

Opravljjen kolokvij in poročilo sta pogoj za pristop k izpitu.		Partial exam and laboratory report are a prerequisite for taking the exam.
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Reference nosilca / Lecturer's references:

DEVETAK, Dušan. Sand-borne vibrations in prey detection and orientation of antlions. V: COCROFT, Reginald Bifield (ur.), et al. *Studying vibrational communication*, (Animal signals and communication, ISSN 2197-7305, vol. 3). Berlin: Springer, 2014, str. 319-330, ilustr., doi: [10.1007/978-3-662-43607-3_16](https://doi.org/10.1007/978-3-662-43607-3_16). [COBISS.SI-ID [20779528](#)]

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](#)]

KRAL, Karl, VERNIK, Martin, DEVETAK, Dušan. The visually controlled prey-capture behaviour of the European mantispid *Mantispa styriaca*. *Journal of Experimental Biology*, ISSN 0022-0949, 2000, 203, str. 2117-2123. [COBISS.SI-ID [10168584](#)]

KRAL, Karl, DEVETAK, Dušan. The visual orientation strategies of *Mantis religiosa* and *Empusa fasciata* reflect differences in the structure of their visual surroundings. *Journal of insect behavior*, ISSN 0892-7553, 1999, vol. 12, no. 6, str. 737-752, ilustr., graf. prikazi. [COBISS.SI-ID [9433096](#)]

DEVETAK, Dušan. Detection of substrate vibration in Neuropteroidea : a review. *Acta zoologica Fennica*, ISSN 0001-7299, 1998, 209, str. 87-94, ilustr. [COBISS.SI-ID [7098376](#)]

DEVETAK, Dušan, AMON, Tomaž. Substrate vibration sensitivity of the leg scolopidial organs in the green lacewing, *Chrysoperla carnea*. *Journal of Insect Physiology*, ISSN 0022-1910. [Print ed.], 1997, vol. 43, no. 5, str. 433-437. [COBISS.SI-ID [5902344](#)]