



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	6
Undergraduate university programme Ecology with Nature Conservation, 1 st degree	/	3	6

Vrsta predmeta / Course type

Obvezni / Compulsory

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
45			30		105	6

Nosilec predmeta / Lecturer:

Jan Podlesnik

Jeziki /

Languages:

Predavanja /

Lectures:

Slovenski / Slovenian

Vaje / Tutorial:

Slovenski / Slovenian

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

Vsaka izmed naštetih obveznosti v načinih
ocenjevanja mora biti opravljena s pozitivno oceno.

Pozitivna ocena laboratorijskega dela je pogoj za
pristop k pisnemu izpitu.

Prerequisites:

Each of the mentioned commitments must be
assessed with a passing grade.

Passing grade of the laboratory work is required for
taking the written exam.

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 krvožilni sistem.
 Izmenjava plinov – dihanje.
 Ionsko in osmotsko ravnotežje.
 Prehrana in prebava.

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.

Temeljni literatura in viri / Readings:

Temeljna literatura / Basic:

Randall, D. J., Burggren, W. W., & French, K. (2002). Eckert animal physiology: mechanisms and adaptations (5th ed., str. XVII, 736, 56). W. H. Freeman and Company.

Priporočena literatura / Recommended:

Hill, R. W., Wyse, G. A., & Anderson, M. (2018). Animal physiology (4th ed., international, str. VII, 828, pril. (loč. pag.)). Oxford University Press.

Moyes, C. D., & Schulte, P. M. (2014). Principles of animal physiology (2nd ed., Pearson new int. ed., str. II, 758). Pearson.

Schmidt-Nielsen, K. (2010). Animal physiology: adaptation and environment (11th printing, str. VIII, 612). Cambridge University Press.

Ashcroft, F. M. (2011). Življenje v skrajnostih: umetnost preživetja (1. izd., str. 292). Zavod Republike Slovenije za šolstvo.

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 živčnega sistema
- Predstaviti temeljne fiziološke procese v živalskem organizmu

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, hormonal and nervous system
- To present fundamental physiological processes in animal organisms.

Predvideni študijski rezultati:

Znanje in razumevanje:

- opisati vlogo membran pri temeljnih fizioloških procesih;
- razložiti zgradbo organov in povezavo zgradbe s funkcijo;
- načrtovati ter izvajati eksperiment in izsledke interpretirati;
- razumeti in zagovarjati etične principe pri poskusih na živalih.

Intended learning outcomes:

Knowledge and understanding:

- explain the role of membranes in basic physiological processes;
- explain the structure of organs and the relationship of structure to function;
- design, conduct and report on experiments in animal physiology;
- explain and defend ethical approach in animal experiment.

Metode poučevanja in učenja:

Predavanja

Laboratorijske vaje – individualno eksperimentalno delo

Learning and teaching methods:

Lectures

Laboratory exercises – individual experimental practice

Načini ocenjevanja:

Način (pisni izpit, ustno izpraševanje, naloge, projekt)

Pisni izpit
Laboratorijsko delo

Delež (v %) /

Weight (in %) **Assessment:**

Type (examination, oral, coursework, project):

Written exam
Laboratory work**Opombe:**

Pisni izpit se lahko nadomesti s kolokviji v enakem deležu 50%.

Comments:

Written exam can be replaced by written midterm examination in the weight of 50%.

Reference nosilca / Lecturer's references:

DEVETAK, Dušan, PODLESNIK, Jan, SCHARF, Inon, KLENOVŠEK, Tina. Fine sand particles enable antlions to build pitfall traps with advanced three-dimensional geometry. *Journal of Experimental Biology*. Aug. 2020, vol. 223, no. 15, str. 1-10. ISSN 0022-0949. DOI: 10.1242/jeb.224626.

[COBISS.SI-ID 28827907]

KLENOVŠEK, Tina, DEVETAK, Dušan, PODLESNIK, Jan. Analiza geometrije lijakastih pasti v pesku. V: POTOČNIK, Božidar (ur.). *ROSUS 2023 : računalniška obdelava slik in njena uporaba v Sloveniji 2023 : zbornik 17. strokovne konference* : [23. marec 2023, Maribor, Slovenija]. 1. izd. Maribor: Univerza v Mariboru, Univerzitetna založba, 2023. Str. 69-75, ilustr. ISBN 978-961-286-721-8. <https://press.um.si/index.php/ump/catalog/book/769>, Digitalna knjižnica Univerze v Mariboru – DKUM, DOI: 10.18690/um.feri.4.2023.7, DOI: 20.500.12556/DKUM-88107.

DEVETAK, Dušan, NAHIRNIĆ, Ana, JAKŠIĆ, Predrag, KLOKOČOVNIK, Vesna, KLENOVŠEK, Tina, BADANO, Davide, PODLESNIK, Jan. Review of Antlions (Insecta: Neuroptera: Myrmeleontidae) in North Macedonia. *Acta zoologica bulgarica*. 2023, vol. 75, no. 2, str. 169-180, ilustr. ISSN 0324-0770. <https://www.acta-zoologica-bulgarica.eu/2023/002661.pdf>

MARTINEZ, Vanessa, SILLAM-DUSSÈS, David, DEVETAK, Dušan, LORENT, Vincent, PODLESNIK, Jan. Antlion larvae localize long distant preys by a mechanism based on time difference. *Journal of comparative physiology. A, Sensory, neural, and behavioral physiology*. 2024, vol. 210, iss. 1, str. 35-45, ilustr. ISSN 0340-7594. Digitalna knjižnica Univerze v Mariboru – DKUM, DOI: 10.1007/s00359-023-01641-x, DOI: 20.500.12556/DKUM-88348.

PODLESNIK, Jan, STRITIĆ, PELJHAN, Nataša, DEVETAK, Dušan. Sensitivity of the subgenual organ in adult *Euroleon nostras* (Geoffroy in Fourcroy, 1785) antlions (Neuroptera: Myrmeleontidae) to vibrational stimuli = Občutljivost subgenualnega organa odraslih volkcev *Euroleon nostras* (Geoffroy in Fourcroy, 1785) (Neuroptera: Myrmeleontidae) na vibracijske dražljaje = Sensibilità dell'organo subgenuale negli adulti di *Euroleon nostras* (Geoffroy in Fourcroy, 1785) (Neuroptera: Myrmeleontidae) agli stimoli vibrazionali. V: JUGOVIC, Jure (ur.), et al. *Seventh Slovenian Entomological Symposium with international attendance : book of abstracts : Izola, 31 January and 1 February 2025 = Sedmi slovenski entomološki simpozij z mednarodno udeležbo : knjiga povzetkov : Izola, 31. januar in 1. februar 2025 = Settimo simposio entomologico Sloveno con partecipazione internazionale : libro degli abstract : Isola, 31 gennaio e 1 febbraio 2025*. Electronic ed. Koper; = Capodistria: University of Primorska Press: = Založba Univerze na Primorskem: = Edizioni Università del Litorale, 2025. Str. 40-41. ISBN 978-961-293-428-6. <https://www.hippocampus.si/ISBN/978-961-293-428-6.pdf>.