



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Senzorični sistemi
Course title:	Sensory Systems

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Biologija in ekologija z naravovastvom, 2. stopnja	/	1,2	Poletni / Zimski
Biology and Ecology with Nature Conservation, 2 nd cycle	/	1,2	Summer / Winter

Vrsta predmeta / Course type

Izbirni / Elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Druge oblike študija	Samost. delo Individual work	ECTS
15	15		15		135	6

Nosilec predmeta / Lecturer:

Dušan Devetak

Jeziki /

Predavanja / Lectures: Slovenski / Slovenian

Languages:

Vaje / Tutorial: Slovenski / Slovenian

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

Jih ni.

Prerequisites:

No prerequisites.

Vsebina:

Content (Syllabus outline):

- Celična in molekularna biologija nevrona. Nastanek in prevajanje živčnih impulzov.
- Komunikacija med nevroni, sinaptični prenos. Posinaptični mehanizmi; integracija in sinaptična plastičnost.
- Senzorični receptorji: zgradba in senzorična transdukcija. Razmerje med jakostjo dražljaja in odgovorom. Adaptacija. Senzorični vzdražni prag.
- Mehanorecepcija. Mehanotransdukcija. Mehanoreceptorji nevretenčarjev. Mehanoreceptorji vretenčarjev.
- Fotorecepcija. Svetloba. Fotokemija. Elektrofiziologija. Nastanek slike. Barvno gledanje

- Cell and molecular biology of the neuron. Generation and conduction of the nerve impulses.
- Communication between neurons, synaptic transmission. Postsynaptic mechanisms; integration and synaptic plasticity.
- Sensory receptors: structure and sensory transduction. Relationship between stimulus intensity and response. Adaptation. Sensory threshold.
- Mechanoreceptors. Mechanotransduction. Invertebrate mechanoreceptors. Vertebrate mechanoreceptors.
- Photoreception. Light. Photochemistry. Electrophysiology. Image formation. Colour vision.

Temeljni literatura in viri / Readings:

Temeljni viri / Basic:

Guyton, A.C., Hall, J.E. 2000. Medical physiology. Tenth edition. Saunders Company, Philadelphia.

Priporočeni viri / Recommended:

d'Ettorre, P., Hughes, D. P. 2008. Sociobiology of communication : an interdisciplinary perspective. Oxford, New York : Oxford University Press.

Rubenstein, D.R., Alcock, J. 2018. Animal behavior. 11th ed. Oxford University Press.

Withers, P. C. 2002. Comparative Animal Physiology. Saunders College Publishing, Philadelphia, New York.

Wyatt, T.D. 2003. Pheromones and animal behaviour. Communication by smell and taste. Cambridge University Press, Cambridge.

Cilji in kompetence:

- Predstaviti raznolikost in kompleksnost senzoričnih sistemov
- Podati povezavo med živalskim organizmom in njegovim zunanjim in notranjim okoljem
- Pojasniti integracijsko vlogo senzoričnega

Objectives and competences:

- To present diversity and complexity of the sensory systems
- To give the connection between animal organism and its internal and external environment
- To explain integrative role of sensory

sistema, živčevja ter motoričnega sistema

- Sposobnost načrtovati in izvesti preproste eksperimente za testiranje odzivov oseba na kontrolirane spremembe v njegovem okolju
- Sposobnost ovrednotiti rezultate fiziološkega poskusa

system, nervous system and motor system

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

Predvideni študijski rezultati:

Po uspešno opravljeni učni enoti naj bi bili študenti zmožni:

- opredeliti značilnosti čutilnih celic in razložiti njihovo delovanje;
- na primerih pojasniti temeljne značilnosti kemo-, mehano- in fotoreceptorjev;
- razumeti in zagovarjati etične principe pri poskusih na živalih.

Intended learning outcomes:

By the end of this course students should be able to:

- define properties of sensory cells and explain their function;
- explain basic properties of chemo-, mechano- and photoreceptors;
- explain and defend ethical approach in animal experiment.

Metode poučevanja in učenja:

- Predavanja
- Laboratorijske vaje – individualno eksperimentalno delo
- Seminar

Learning and teaching methods:

- Lectures
- Laboratory exercises – individual experimental practice
- Seminar

Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt): Študent mora opraviti:

- Kolokvij iz vaj
- Seminarska naloga
- Pisni izpit

30
30
40

Type (examination, oral, coursework, project): The following should be done:

- Partial examination of experimental practice
- Seminar essay
- Written exam

Reference nosilca / Lecturer's references:

DEVETAK, Dušan, ARNETT, Amy E. Preference of antlion and wormlion larvae (Neuroptera: Myrmeleontidae; Diptera: Vermileonidae) for substrates according to substrate particle sizes. *European Journal of Entomology*, ISSN 1210-5759, 2015, vol. 112, iss. 3, str. 500-509, doi: [10.14411/eje.2015.052](https://doi.org/10.14411/eje.2015.052). [COBISS.SI-ID [21327368](https://www.cobiss.si/id/21327368)]

DEVETAK, Dušan, PODLESNIK, Jan, KLOKOČOVNIK, Vesna. Predator-prey interactions in antlions: transmission of vibrational signals deep into the sand. *Acta entomologica slovenica*, ISSN 1318-1998, dec. 2018, vol. 26, št. 2, str. 121-130, ilustr. [COBISS.SI-ID [1957365](#)]

KLOKOČOVNIK, Vesna, PODLESNIK, Jan, DEVETAK, Dušan. Occurrence of the antlion tribe Acanthaclisini in the Balkan Peninsula : (Neuroptera, Myrmeleontidae). *Spixiana : Zeitschrift für Zoologie*, ISSN 0341-8391, 2016, bd. 39, h. 1, str. 99-104, ilustr. [COBISS.SI-ID [22594568](#)]

PODLESNIK, Jan, KLOKOČOVNIK, Vesna, LORENT, Vincent, DEVETAK, Dušan. Prey detection in antlions: propagation of vibrational signals deep into the sand. *Physiological Entomology*, 2019, in press.