



Univerza v Mariboru



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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 naravovarstvom, 2. stopnja	/	1/2	Poletni/ Zimski
Biology and Ecology with Nature Conservation, 2 nd Level	/	1/2	Summer/ Winter

Vrsta predmeta / Course type Izbirni / Elective

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
15	15		15		135	6

Nosilec predmeta / Lecturer: Dušan Devetak

Jeziki / Languages:	Predavanja / Lectures:	Slovensko / Slovene
	Vaje / Tutorial:	Slovensko / Slovene

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

Prerequisites:

Poznavanje metod dela v fiziologiji živali.

Knowledge of methods of animal physiology.

Vsebina:

- 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

Content (Syllabus outline):

- 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.
- Phororeception. Light. Photochemistry. Electrophysiology. Image formation. Colour vision.

Temeljni literatura in viri / Readings:

- Halliday, T. 1998: The senses and communication. Springer and The Open University, Berlin, New York.
- Kandell, E. R., J. H. Schwartz, T. M. Jessel, 2000: Principles of Neural Science: 4th edition. McGraw-Hill Professional Publishing
- Withers, P. C., 2002: Comparative Animal Physiology. Saunders College Publishing, Philadelphia, New York.

Cilji in kompetence:

- Predstaviti raznolikost in kompleksnost senzoričnih sistemov
- Podati povezavo med živalskim organizmom in njegovim zunanjim in notranjim okoljem
- Pojasniti integracijsko vlogo senzoričnega sistema, živčevja ter motoričnega sistema
- Sposobnost načrtovati in izvesti preproste eksperimente za testiranje odzivov osebka na kontrolirane spremembe v njegovem okolju
- Sposobnost ovrednotiti rezultate fiziološkega poskusa

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 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:**Znanje in razumevanje:**

- Povezava med organizmom in njegovim zunanjim in notranjim okoljem
- Vloga integracijskih sistemov - senzoričnega sistema in živčevja ter motoričnega sistema
- Kompleksnost centralnega živčnega sistema

Intended learning outcomes:**Knowledge and understanding:**

- Connection between organism and its internal and external environment
- Integrative role of sensory system, motor system and nervous system
- Complexity of central nervous system

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Metode poučevanja in učenja:

- Predavanja
- Laboratorijske vaje – individualno eksperimentalno delo

Learning and teaching methods:

- Lectures
- Laboratory excersises – individual experimental practice

Načini ocenjevanja:

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

- Kolokvij iz vaj
- Seminarska naloga
- Pisni izpit

Delež (v %) /

Weight (in %)

30

30

40

Assessment:

Type (examination, oral, coursework, project):

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

Reference nosilca / Lecturer's references:

DEVETAK, Dušan, NOVAK, Tone, JANŽEKOVIČ, Franc. Effect of substrate density on behaviour of antlion larvae (Neuroptera: Myrmeleontidae). *Acta oecologica*. [Print ed.], 2012, vol. 43, str. 1-7. [COBISS.SI-ID [19210248](#)]

KLOKOČOVNIK, Vesna, DEVETAK, Dušan, ORLAČNIK, Marina. Behavioral plasticity and variation in pit construction of antlion larvae in substrates with different particle sizes. *Ethology*, Nov. 2012, vol. 118, iss. 11, str. 1102-1110, doi: [10.1111/eth.12012](#). [COBISS.SI-ID [19324936](#)]

NOVAK, Tone, KLOKOČOVNIK, Vesna, LIPOVŠEK DELAKORDA, Saška, DEVETAK, Dušan, JANŽEKOVIČ, Franc. Preferences for different substrates in *Phalangium opilio* (Opiliones: Phalangiidae) in natural environment = Preference navadnega matije, *Phalangium opilio* (Opiliones: Phalangiidae) do različnih substratov v naravnem okolju. *Acta biol. slov.*. [Tiskana izd.], 2009, vol. 52, št. 1, str. 29-35. [COBISS.SI-ID [26360793](#)]

DEVETAK, Dušan. Wormlion *Vermileo vermileo* (l.) (Diptera: Vermileonidae) in Slovenia and Croatia = Vermileone, *Vermileo vermileo* (l.) (Diptera: vermilionidae), in Slovenia e Croazia. *Ann, Ser. hist. nat.*, 2008, letn. 18, št. 2, str. 283-286, ilustr. [COBISS.SI-ID [16594184](#)]