Univerza v Mariboru
University of Maribor

Fakulteta za naravoslovje in matematiko / Faculty of Natural Sciences and Mathematics

OPIS PREDMETA / SUBJECT SPECIFICATION

Predmet:	**Senzorični sistemi**
Subject Title:	**Sensory Systems**

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Biologija in ekologija z naravovarstvom /Biology and ecology with nature conservation	Biologija /Biology	1	**1**

Univerzitetna koda predmeta / University subject code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Lab. work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
30	15		30		135	**7**

Nosilec predmeta / Lecturer: Dušan DEVETAK

Jeziki / Languages: **Predavanja / Lecture:** slovenski / Slovenian
Vaje / Tutorial: slovenski / Slovenian

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

Poznavanje eksperimentalnih metod v fiziologiji.

Prerequisites:

Knowledge of experimental methods in 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

Contents (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 študijski viri / Textbooks:

- 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:	**Objectives:**
• 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	• 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

Predvideni študijski rezultati:	**Intended learning outcomes:**
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 Prenesljive/ključne spretnosti in drugi atributi: • Sposobnost načrtovati in izvesti preproste eksperimente za testiranje odzivov osebka na kontrolirane spremembe v njegovem okolju • Sposobnost ovrednotiti rezultate fiziološkega poskusa	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 Transferable/Key Skills and other attributes: • 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

Metode poučevanja in učenja:	**Learning and teaching methods:**
• Predavanja • Laboratorijske vaje – individualno eksperimentalno delo	• Lectures • Laboratory excersises – individual experimental practice

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
• Kolokvij iz vaj • Seminarska naloga • Pisni izpit	30 30 40	• Partial examination of experimental practice • Seminar essay • Written exam

Materialni pogoji za izvedbo predmeta : ***Material conditions for subject realization***

• *Multimedijska predavalnica* • *Laboratorij za fiziologijo živali*	• *Lecture hall for multimedia presentation* • *Laboratory for animal physiology*

Obveznosti študentov:	***Students' commitments:***
(pisni, ustni izpit, naloge, projekti)	*(written, oral examination, coursework, projects):*
• Kolokvij iz vaj • Seminarska naloga • Pisni izpit	• Partial examination of experimental practice • Seminar essay • Written exam