



Univerza v Mariboru

Fakulteta za naravoslovje  
in matematiko

### UČNI NAČRT PREDMETA / COURSE SYLLABUS

<b>Predmet:</b>	Biologija človeka
<b>Course title:</b>	Human Biology

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Univerzitetni študijski program Biologija, 1. stopnja		1.	2.
Undergraduate university programme Biology, 1st degree		1 <sup>st</sup>	2 <sup>nd</sup>

**Vrsta predmeta / Course type**

**Univerzitetna koda predmeta / University course code:**

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30			30		120	6

**Nosilec predmeta / Lecturer:**

<b>Jeziki / Languages:</b>	<b>Predavanja / Lectures:</b>	slovenski / slovene
	<b>Vaje / Tutorial:</b>	slovenski / slovene

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

Pogojev ni.

**Prerequisites:**

None.

**Vsebina:**

Pri obravnavi telesa se vseskozi prepletata funkcionalna anatomija in fiziologija posameznih organov.

- Uvod v zgradbo in delovanje človeškega organizma; homeostaza, regulacijski procesi
- Organizacijske ravni organizma: celica, tkivo, organ, organski sistem, organizem kot celota
- Koža
- Okostje, vezi, sklepi, nesklepne povezave
- Mišičje: ogrodno, srčno, gladko
- Živčevje: osrednje, obrobno; somatsko, vegetativno (simpatik, parasimpatik)
- Čutila
- Endokrini sistem, žleze z notranjim izločanjem
- Srčno-krvožilni sistem: kri, srce, krvne žile; cirkulacija: sistemski in mali krvni obtok, limfatski sistem
- Dihala: dihanje: zunanje, notranje, celično; dihalni plini
- Prebavila: presnova, prebava, prebavna cev, prebavne žleze
- Sečila: prvotni, drugotni seč
- Spolovila: urogenitalni sistem; menstrualni cikel; razvoj zarodka in ploda
- Zdravstvene težave v sodobni razviti družbi: debelost, rak, stres
- Človek v okolju, omejenost virov, uničevanje in onesnaževanje okolja; odgovornost za ohranjanje globalne biodiverzitet in nujnost zaradi lastnega preživetja

**Content (Syllabus outline):**

During the course, the functional anatomy and physiology are the current way of discussing the human body.

- Introduction into the structure and function of the human body; homeostasis, regulation processes
- Organisational levels of the human body: cell, tissue, organ, organic system, organism as a whole
- Integumentary system
- Skeletal system, ligaments, articulations, Joints
- Musculature: skeletal, heart, smooth muscle
- Nervous system: CNS, peripheral nerves; somatic, autonomous nervous system (sympathetic, parasympathetic)
- Sensory system: sensory organs
- Endocrine system: endocrine glands
- Cardiovascular system: blood, heart, blood vessels, blood circulation: systemic, pulmonary, lymphatic system
- Respiratory system: pulmonary, tissue, cellular respiration, respiration gasses
- Digestive system: metabolism, digestion, digestion tract, digestive glands
- Urinary system: urogenital system, menstrual cycle; embryonal and fetal development
- Health and disease in developed modern society
- The man in its environments, resources limits, devastation and pollution of environments, responsibility for the maintenance of global biodiversity and its necessity for the survival.

**Temeljni literatura in viri / Readings:**

Faller The human body: An Introduction to structure and Function. Thieme, 2004.  
Mader, S.S., 2007: Human Biology. McGraw-Hill Education.  
Costanzo Physiology, Saunders 2013.

#### **Cilji in kompetence:**

- Študenti se seznanijo s človeškim organizmom kot biotskim bitjem
- Spoznajo osnovne mehanizme kibernetnega delovanja organizma
- Seznanijo se s temeljno zgradbo in delovanjem posameznih organskih sistemov ter celotnega organizma
- Seznanijo se s pomenom razmerij med človeškim organizmom in okoljem

#### **Objectives and competences:**

- Students get acquainted with the human organism as a biotic being
- Students get acquainted with the main mechanisms of the cybernetic functioning of the human organism
- They get basic knowledge of the structure and function of each organic system, and the organism as a whole
- They get acquainted with the significance of the interactions between the human organism and its environment

#### **Predvideni študijski rezultati:**

Znanje in razumevanje:

- Poznajo osnovno zgradbo in delovanje posameznih organov, organskih sistemov ter celotnega organizma
- Razumejo pomen kakovostnega okolja ter nujnost aktivnosti za njegovo ohranjanje
- Razumejo pomen kulture za ohranitev civilizacije

Prenesljive/ključne spretnosti in drugi atributi:

- Znajo anatomske orientirati posamezne organe in opisati njihovo lego ter vlogo v organizmu
- Znajo splošno presojati o ustreznosti oziroma neustreznosti konkretnih dejavnikov okolja za ohranjanje zdravja

#### **Intended learning outcomes:**

Knowledge and understanding:

- Students know the basic structure and function of each organ, organic system and the whole organism
- They understand the significance of quality environments and need for their active preservation
- They understand the meaning of culture in the maintenance of the civilisation

Transferable/Key Skills and other attributes:

- They get skills to properly anatomically orient each organ and to describe their position and function within the organism
- They can generally judge the environmental factors for their appropriateness or inappropriateness, respectively, for the health maintenance

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**Metode poučevanja in učenja:**

- Predavanja
- Laboratorijske vaje
- Individualno delo

**Learning and teaching methods:**

- Lectures
- Laboratory excersises
- Individual work

Delež (v %) /

**Načini ocenjevanja:**

Weight (in %)

**Assessment:**

<ul style="list-style-type: none"> <li>• Kolokvij iz praktičnega dela</li> <li>• Pisni izpit</li> </ul>	<p>30 %</p> <p>70 %</p>	<ul style="list-style-type: none"> <li>• Partial exam of experimental practice</li> <li>• Written exam</li> </ul>
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**Reference nosilca / Lecturer's references:**

STOŽER, Andraž, GOSAK, Marko, **DOLENŠEK, Jurij**, PERC, Matjaž, MARHL, Marko, RUPNIK, Marjan, KOROŠAK, Dean. Functional connectivity in islets of Langerhans from mouse pancreas tissue slices. PLoS computational biology, ISSN 1553-734X, Feb. 2013, vol. 9, iss. 2, str. e100292312-1-e1002923-12.

STOŽER, Andraž, **DOLENŠEK, Jurij**, RUPNIK, Marjan. Glucose-stimulated calcium dynamics in Islets of Langerhans in acute mouse pancreas tissue slices. PloS one, ISSN 1932-6203, 2013, vol. 8, iss. 1, str. 1-13, ilustr.

**DOLENŠEK, Jurij**, STOŽER, Andraž, SKELIN, Maša, MILLER, Evan, RUPNIK, Marjan. The relationship between membrane potential and calcium dynamics in glucose-stimulated beta cell syncytium in acute mouse pancreas tissue slices. PloS one, ISSN 1932-6203, 2013, vol. 8, iss. 12, str. 1-16, ilustr.

STOŽER, Andraž, GOSAK, Marko, **DOLENŠEK, Jurij**, PERC, Matjaž, MARHL, Marko, RUPNIK, Marjan, KOROŠAK, Dean. Functional connectivity in islets of Langerhans from mouse pancreas tissue slices. PLoS computational biology, ISSN 1553-734X, Feb. 2013, vol. 9, iss. 2, str. e100292312-1-e1002923-12.

**DOLENŠEK, Jurij**, RUPNIK, Marjan, STOŽER, Andraž. Structural similarities and differences between the human and the mouse pancreas. Islets, ISSN 1938-2022, 2015, vol. 7, iss. 1, 16 str.

GOSAK, Marko, STOŽER, Andraž, MARKOVIČ, Rene, **DOLENŠEK, Jurij**, PERC, Matjaž, RUPNIK, Marjan, MARHL, Marko. Critical and supercritical spatiotemporal calcium dynamics in beta cells. *Frontiers in physiology*, ISSN 1664-042X, 2017, vol. 8, str. 1-17

GORGIEVA, Selestina, VIVOD, Vera, MAVER, Uroš, GRADIŠNIK, Lidija, **DOLENŠEK, Jurij**, KOKOL, Vanja. Internalization of (bis)phosphonate-modified cellulose nanocrystals by human osteoblast cells. *Cellulose*, ISSN 0969-0239, October 2017, vol. 24, iss. 10, str. 4235-4252.

SKELIN, Maša, **DOLENŠEK, Jurij**, RUPNIK, Marjan, STOŽER, Andraž. The triggering pathway to insulin secretion : functional similarities and differences between the human and the mouse [beta] cells and their translational relevance. *Islets*, ISSN 1938-2022,

GOSAK, Marko, MARKOVIČ, Rene, **DOLENŠEK, Jurij**, RUPNIK, Marjan, MARHL, Marko, STOŽER, Andraž, PERC, Matjaž. Network science of biological systems at different scales : a review. *Physics of life reviews*, ISSN 1873-1457.

**DOLENŠEK, Jurij**, ŠPELIČ, Denis, SKELIN, Maša, ŽALIK, Borut, GOSAK, Marko, RUPNIK, Marjan, STOŽER, Andraž. Membrane potential and calcium dynamics in beta cells from mouse pancreas tissue slices : theory, experimentation, and analysis. *Sensors*, ISSN 1424-8220, 2015, vol. 15, iss. 11, str. 27393-27419, ilustr.