



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Biologija žuželk
Course title:	Biology of Insects

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:

Jan Podlesnik

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):

- Koža. Členjenost telesa. Biokemija in presnova žuželk. Prehrana in prebava.
- Vsebnost vode, osmoregulacija, izločanje.
- Dihala. Hemolimfa in cirkulacija.
- Živčevje. Senzorični receptorji.
- Mišice in gibanje. Učenje in spomin.
- Hormonalni sistem. Razmnoževanje in razvoj.
- Socialne žuželke. Žuželke in rastline.
- Entomofage žuželke. Bioluminiscenca.
- Žuželke in mikroorganizmi.
- Medicinska entomologija.
- Biološka, kemijska in biotehniška kontrola škodljivcev. Regulacija gostote populacije.
- Biogeografija.
- Sistem žuželk.
- Žuželke v Sloveniji.

- Integument. Body segmentation. Biochemistry and metabolism. Nutrition and digestion.
- Water balance, osmoregulation, excretion.
- Respiratory system. Hemolymph and circulation.
- Nervous system. Sensory receptors.
- Muscles and locomotion. Learning and memory.
- Endocrine system. Reproduction and development.
- Social insects. Insects and plants.
- Entomophagous insects. Bioluminescence.
- Insects and microorganisms.
- Medical entomology.
- Biological, chemical and biotechnical pest control.
- Regulation of population density.
- Biogeography.
- Insect systematics.
- Insects in Slovenia.

Temeljni literatura in viri / Readings:

Temeljni viri / Basic:

– Chapman, R.F., S. J. Simpson, A. E. Douglas, 2012: The insects. Structure and function. 4th Edition. Cambridge University Press, London.

ali / or

– Dettner, K., W. Peters, 2010: Lehrbuch der Entomologie. Elsevier GmbH, München.

Priporočeni viri / Recommended:

– Gullan, P.J., P.S. Cranston, 2015: The Insects: An Outline of Entomology 5th Edition. Wiley-Blackwell, West Sussex, UK.

– Harrison, J.F., H.A. Woods, S.P. Roberts, 2012: Ecological and environmental physiology of insects. Oxford University Press, Oxford.

– Jurc, M., 2011: Gozdna zoologija (3. natis). Univerza v Ljubljani, Biotehniška fakulteta, Oddelek za gozdarstvo in obnovljive gozdne vire.

– Pedigo, L.P., M.E. Rice, 2015: Entomology and Pest Management, Sixth Edition. Waveland Press, Inc, Long Grove, IL.

– Resh, V. H., R. T. Cardé, 2009: Encyclopedia of insects 2nd Edition. Academic Press – Elsevier, New York.

– Schowalter, T. D., 2016: Insect ecology. An ecosystem approach. 4th ed. Elsevier, Amsterdam.

– Wermelinger, B., 2017: Insekten im Wald – Vielfalt, Funktionen und Bedeutung.

Eidg. Forschungsanstalt WSL, Birmensdorf; Haupt, Bern.

Cilji in kompetence:

- Razumeti kompleksnost biologije žuželk
- Spoznati predstavnike glavnih redov žuželk
- Poznati in razumeti vlogo gospodarsko pomembnih žuželk
- Poznati značilne predstavnike slovenske entomofavne
- Študente seznaniti z zbiranjem žuželk na terenu in determinacijo v laboratoriju

Objectives and competences:

- To understand complexity of insect biology
- To present representatives of the most important insect orders
- To understand role of the economically important insects
- Knowledge of important representatives of Slovenian entomofauna
- Ability to conduct appropriate collecting in the field and determination in laboratory

Predvideni študijski rezultati:

Po uspešno opravljeni učni enoti naj bi bili študenti zmožni:

- pojasniti vlogo adaptacij, ki so vodile do uspeha žuželk;
- pojasniti in razpravljati o koevoluciji med žuželkami-opraševalci in višjimi rastlinami;
- ovrednotiti najpomembnejše invazivne vrste v Evropi;
- pojasniti pomen žuželk gozda in kmetijskih ekosistemov.

Intended learning outcomes:

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

- explain adaptations that lead to success of insects;
- explain and discuss co-evolution of insects-pollinators and higher plants;
- evaluate the most important invasive insects in Europe;
- explain importance of insects in forest and agricultural ecosystems.

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): Študent mora opraviti: Seminarско nalogo in poročilo vezano na laboratorijske vaje in individualno delo

Delež (v %) /

Weight (in %)

Assessment:

Type (examination, oral, coursework, project): The following should be done: Seminar essay and report on laboratory exercises and individual work
Written exam

40

60

Pisni izpit		
-------------	--	--

Reference nosilca / Lecturer's references:

DEVETAK, Dušan, NAHIRNIĆ-BESHKOVA, Ana, JAKŠIĆ, Predrag, KLOKOČOVNIK, Vesna, KLENOVŠEK, Tina, BADANO, Davide, PODLESNIK, Jan. Review of Antlions (Insecta: Neuroptera: Myrmeleontidae) in North Macedonia. *Acta Zoologica Bulgarica*. 2023. <https://www.acta-zoologica-bulgarica.eu/2023/002661.pdf>

NOVAK, Tone, SLANA NOVAK, Ljuba, KOZEL, Peter, SCHAIDER, Miriam, KOMPOSCH, Christian, LIPOVŠEK DELAKORDA, Saška, PODLESNIK, Jan, PAUŠIČ, Igor, RASPOTNIG, Günther. Hidden diversity within the *Nemastoma bidentatum* Roewer, 1914 complex (Opiliones: Nemastomatidae). Part I, Morphological evidence. *European Journal of Taxonomy*. 2021, vol. 777, str. 1-67, ilustr. ISSN 2118-9773. DOI: 10.5852/ejt.2021.777.1561. [COBISS.SI-ID 83164163]

PODLESNIK, Jan (avtor, fotograf). Podlubniki Pohorja. *Proteus* : ilustriran časopis za poljudno prirodoznanstvo. [Tiskana izd.]. okt. 2020-jan. 2021, letn. 83, [št.] 2/3/4/5, str. 139-143, 238-239, ilustr. ISSN 0033-1805. <http://www.dlib.si/details/URN:NBN:SI:DOC-IDYK0Y7M>. [COBISS.SI-ID 50480643]

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](https://doi.org/10.1242/jeb.224626). [COBISS.SI-ID [28827907](#)], [JCR, SNIP, WoS, Scopus]

financer: ARRS, Programi, P1-0403, SI, Računsko intenzivni kompleksni sistemi

PODLESNIK, Jan, KLOKOČOVNIK, Vesna, LORENT, Vincent, DEVETAK, Dušan. Prey detection in antlions : propagation of vibrational signals deep into the sand. *Physiological entomology*. 2019, vol. 44, iss. 3/4, str. 215-221. ISSN 0307-6962. DOI: [10.1111/phen.12295](https://doi.org/10.1111/phen.12295). [COBISS.SI-ID [24646664](#)], [JCR, SNIP]

financer: ARRS, Programi, P1-0403, SI, Računsko intenzivni kompleksni sistemi