



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Izbrana poglavja iz ekologije krasa
Course title:	Selected Topics in Karst Ecology

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Doktorski študij Ekološke znanosti, 3. stopnja		1. ali 2.; 1st or 2nd	1. 2. ali 3. ; 1st, 2nd or 3rd
Doctoral Study Ecological Sciences, 3rd degree			

Vrsta predmeta / Course type

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
5				5	140	5

Nosilec predmeta / Lecturer:

Jeziki /	Predavanja / Lectures:	slovenski / slovene
Languages:	Vaje / Tutorial:	slovenski / slovene

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

Zaželeno je poznavanje osnovnih pojmov s področja biologije in ekologije.

Prerequisites:

Knowledge of basic concepts in biology and ecology is desired.

Vsebina:

Predmet obravnava naslednja poglavja: Ekologija in biologija kraških površinskih in podzemeljskih habitatov in njihova biodiverziteteta; Mokrišča na krasu – tipi presihajočih jezer, »turloughs«; Plitvi podzemeljski habitat; Viri energije v podzemeljskih okoljih; Ekološki in evolucijski pregled organizmov; Biotske interakcije in struktura združb; Adaptacije organizmov v

Content (Syllabus outline):

The following chapters are included: Ecology and biology of karst surface and subterranean habitats and their biodiversity; Karst wetlands – types of intermittent lakes, "turloughs"; Shallow subterranean habitats; Sources of energy in subterranean environments; Ecological and evolutionary survey of organisms; Biotic interactions and community structure; Adaptations to subterranean life; Colonization

podzemlju; Kolonizacija in speciacija v podzemeljskih okoljih – alopatrična in parapatrična speciacija, vikarianca in disperzija; Biogeografija; Varovanje in zaščita kraških površinskih in podzemeljskih habitatov ter organizmov.

and speciation in subterranean environments – allopatric and parapatric speciation, vicariance and dispersal; Biogeography; Conservation and protection of surface and subterranean habitats and organisms.

Temeljni literatura in viri / Readings:

- Culver D. C., Kane T. C., Fong D. W. 1995: Adaptation and Natural Selection in Caves. The Evolution of *Gammarus minus*. Harvard Univ. Press, Cambridge.
- Culver D. C., Pipan T. 2009: The Biology of Caves and Other Subterranean Habitats. Oxford University Press, Oxford.
- Culver D. C., Pipan T. 2014: Shallow Subterranean Habitats. Ecology, Evolution, and Conservation. Oxford University Press, Oxford.
- Gaberščik A. 2003: Jezero, ki izginja. Monografija o Cerknškem jezeru. Društvo ekologov Slovenije, Ljubljana.
- Griffiths H. I., Kryštufek B., Reed M. 2004: Balkan Biodiversity. Pattern and Process in the European Hotspot. Kluwer Academic Publishers, Dordrecht.
- Gibert J., Danielopol D. L., Stanford J. A. 1994: Groundwater Ecology. Academic Press, San Diego.
- Pipan T. 2005: Epikarst – a promising habitat. Copepod fauna, its diversity and ecology: a case study from Slovenia (Europe). Založba ZRC, Ljubljana.
- White W. B., Culver D. C. 2012: Encyclopedia of Caves. Elsevier, Amsterdam.
- Wilkens H., Culver D. C., Humphreys W. 2000: Ecosystems of the World. Subterranean Ecosystems. Elsevier, Amsterdam.
- Izbrani članki iz znanstvenih revij. Selected articles from scientific journals.

Cilji in kompetence:

Osnovni cilj predmeta je podati študentom poznavanje vodnih in terestičnih kraških površinskih in podzemeljskih habitatov, razumevanje biologije in ekologije kraških ekosistemov in tam živečih organizmov, njihove evolucije, razumevanje in poznavanje osnovnih fizikalno kemijskih in bioloških razlik med posameznimi kraškimi habitatami ter osnovne naravovarstvene vidike.

Objectives and competences:

The main goal of this course is to give students the knowledge of aquatic and terrestrial types of karst surface and subterranean habitats, understanding of biology and ecology of karst ecosystems and organisms, their evolution, understanding and knowledge of basic physico-chemical and biological differences among karst habitats, and their conservation aspects.

Predvideni študijski rezultati:

Znanje in razumevanje:

Slušatelji pridobijo teoretično in praktično znanje o ekologiji kraških ekosistemov in podzemeljskih habitatov ter njihovi biodiverziteti, biotskih procesih v kraških ekosistemih, ekologiji združb in biogeografiji.

Intended learning outcomes:

Knowledge and understanding:

Students get theoretical and practical knowledge about ecology of karst ecosystems and subterranean habitats and biodiversity, karst ecosystem function, community ecology and biogeography. They get knowledge of

Usposobijo se za analitično vrednotenje in interpretiranje kraških ekosistemov ter razumevanje energijskih, strukturnih in funkcionalnih povezanosti med komponentami kraških ekosistemov ter posledice antropogenega vpliva.

Prenesljive/ključne spretnosti in drugi atributi:

Študenti razvijajo sposobnost prepoznavanja osnovnih ekoloških razlik med globokimi in plitvimi podzemeljskimi habitati, osvojijo osnovna načela pridobivanja ekoloških podatkov v kraških ekosistemih in njihove interpretacije. Študenti poznajo nove pristope v smeri raziskovanja biologije in ekologije kraških habitatov, nove metodologije vzorčenja, standardizacije rezultatov in baz podatkov. Usposobijo se za ekološko raziskovalno delo na krasu.

analytical assessment and interpretation of karst ecosystems and understanding of energetic, structural and functional relations between ecosystem components, and anthropogenic impact.

Transferable/Key Skills and other attributes:

Students develop the ability to recognize basic ecological differences between deep and shallow subterranean habitats, acquire the basic principles of obtaining ecological data in karst ecosystems and their interpretation. Students get familiar with new approaches in direction of biological and ecological research in karst habitats, new methodology of sampling, standardization of results and databases. They are trained to ecological investigations in karst.

Metode poučevanja in učenja:

- Predavanja
- Terenska predavanja in terenske vaje
- Laboratorijske vaje
- Individualno delo na izbrani raziskavi in predstavitev v seminarski obliki

Learning and teaching methods:

- Lectures
- Field lectures and field work
- Laboratory work
- Individual work of a selected investigation and presentation as a seminar work

Delež (v %) /

Weight (in %)

Načini ocenjevanja:

Assessment:

<ul style="list-style-type: none"> • Kratka seminarska naloga in njena predstavitev • Pisni izpit 	<p>50 / 50</p>	<ul style="list-style-type: none"> • Short written seminar and its presentation • Written exam
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Reference nosilca / Lecturer's references:

- CULVER, David C., PIPAN, Tanja. *Shallow subterranean habitats : ecology, evolution, and conservation*. 1st ed. Oxford: Oxford University Press, 2014. XXII, 258 str., ilustr., zvd., graf. prikazi. ISBN 978-0-19-964617-3.
<http://ukcatalogue.oup.com/product/9780199646173.do#>. [COBISS.SI-ID [36933421](#)]
- CULVER, David C., PIPAN, Tanja. Subterranean ecosystems. V: LEVIN, Simon Asher (ur.). *Encyclopedia of biodiversity*. 2nd ed. San Diego [etc.]: Academic Press, 2013, vol. 7, str. 49-62, ilustr. [COBISS.SI-ID [35307053](#)]

- CULVER, David C., PIPAN, Tanja. *The biology of caves and other subterranean habitats*, (Biology of habitats). New York: Oxford University Press, 2009. XVI, 254 str., ilustr. ISBN 978-0-19-921992-6. ISBN 978-0-19-921993-3. [COBISS.SI-ID [29605933](#)]
- PIPAN, Tanja, CULVER, David C. Regional species richness in an obligate subterranean dwelling fauna - epikarst copepods. *Journal of biogeography*, ISSN 0305-0270, 2007, 34, str. 854-861, ilustr. [COBISS.SI-ID [26450221](#)], [JCR, SNIP, WoS do 24. 3. 2014: št. citatov (TC): 14, čistih citatov (CI): 10, normirano št. čistih citatov (NC): 6, Scopus do 25. 3. 2014: št. citatov (TC): 17, čistih citatov (CI): 12, normirano št. čistih citatov (NC): 7]
- PIPAN, Tanja. *Epikarst - a promising habitat : copepod fauna, its diversity and ecology : a case study from Slovenia (Europe)*, (Carsologica, 5). Postojna: Inštitut za raziskovanje krasa ZRC SAZU: = Karst Research Institute at ZRC SAZU; Ljubljana: Založba ZRC: = ZRC Publishing, 2005. 101 str., ilustr., preglednice. ISBN 961-6500-90-2. [COBISS.SI-ID [220477696](#)]