



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Ekologija krasa
Course title:	Karst ecology

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, 2nd level	/	1/2	Summer/ Winter

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
25	20				135	6

Nosilec predmeta / Lecturer:

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

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

Jih ni.

Prerequisites:

No prerequisites.

Vsebina:

Content (Syllabus outline):

Slušatelji se bodo v okviru predmeta seznanili z osnovami ekologije krasa, z biologijo kraških površinskih in podzemeljskih habitatov ter njihovo biodiverzitetu. Spoznali bodo biotske procese, značilne za kraške ekosisteme, vključno s procesi evolucije in adaptacije, kolonizacije in speciacije, vire energije v podzemeljskih habitatih, ekologijo kraških združb, biogeografijo ter naravovarstvo.

Students will be introduced into karst ecology, biology of karst epigeal and subterranean habitats and their biodiversity. The course content includes biotic processes characteristic for karst ecosystems, including evolution and adaptation, colonization and speciation, ecosystem function, sources of energy in subterranean habitats, ecology of karst communities, biogeography, and nature conservation.

Temeljni literatura in viri / Readings:

Obvezni vir / Mandatory source:

Culver D. C., Pipan T. 2019. The biology of caves and other subterranean habitats, (Biology of habitats). 2nd ed. New York: Oxford University Press.

Priporočeno branje / Recommended reading:

Malard F., Griebler C., Retaux S. 2023. Groundwater ecology and evolution. 2nd ed. London: Elsevier.

Ravbar N., Pipan T. 2022. Karst groundwater dependent ecosystems – typology, vulnerability and protection. V: Mehner, T (ur.), Tockner, K (ur.). Encyclopedia of inland waters. 2nd ed. Amsterdam; Oxford; Cambridge: Elsevier.

Pipan T., Deharveng L., Culver D. C. 2020. Hotspots of subterranean biodiversity. *Special Issue. Diversity*. Basel: MDPI.

White W. B., Culver D. C., Pipan T. 2019. Encyclopedia of caves. 3rd ed. London [etc.]: Academic Press, an imprint of Elsevier. *Izbrana poglavja / Selected chapters*.

Moldovan O. T., Kovač L., Halse S. 2018. Cave ecology. Cham: Springer. *Izbrana poglavja / Selected chapters*.

Culver D. C., Pipan T. 2014. Shallow subterranean habitats : ecology, evolution, and conservation. 1st ed. Oxford: Oxford University Press.

Romero A. 2009. Cave Biology. Life in darknes. Cambridge: Cambridge University Press.

Wilkens H., Culver D. C., Humphreys W. 2000. Ecosystems of the World. Subterranean Ecosystems. Amsterdam: Elsevier.

Cilji in kompetence:

Objectives and competences:

Cilj predmeta je podati študentom poznavanje vodnih in terestričnih kraških habitatov, razumevanje in poznavanje osnovnih fizikalno kemijskih in bioloških razlik med globokimi in plitvimi podzemeljskimi habitatmi, razumevanje biologije, ekologije in evolucije kraških habitatov ter osnovne naravovarstvene vidike. Študenti se usposobijo za ekološko raziskovalno delo na področju kraških habitatov.

The main goal of this course is to give students the knowledge of aquatic and terrestrial karst habitats, understanding and knowledge of basic physico-chemical and biological differences between deep and shallow subterranean habitats, understanding of biology, ecology, and evolution of karst habitats and their conservation aspects. Students are trained to ecological research in karst habitats.

Predvideni študijski rezultati:

Po uspešno opravljeni učni enoti bodo študenti zmožni:

- opredeliti posamezne kopenske in vodne kraške habitate ter določiti njihove fizikalno kemijske in biološke parametre;
- razumeti in zagovarjati odvisnost podzemeljskih habitatov od kraškega površja;
- opisati glavne pristope v smeri raziskovanja biologije in ekologije podzemeljskih habitatov;
- opisati, primerjati, razlikovati in razumeti metodologije vzorčenja, standardizacijo rezultatov in baz podatkov, ki se uporabljajo za razumevanje ekologije, biologije in evolucije kraških habitatov in njihovo biodiverziteteto.

Intended learning outcomes:

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

- explain individual terrestrial and aquatic karst habitats, and define their physico-chemical and biological characteristics;
- understand and defend dependence of subterranean habitats from karst surface;
- describe the main approaches to researching biology and ecology of subterranean habitats;
- describe, compare, differentiate and understand sampling methodologies, standardize results and databases that are used to understand the ecology, biology and evolution of karst habitats and their biodiversity.

Metode poučevanja in učenja:

- Predavanja
- Seminar
- Individualno delo na izbrani raziskavi in predstavitev

Learning and teaching methods:

- Lectures
- Seminar
- Individual work on a selected investigation and its presentation

Načini ocenjevanja:

Delež (v %) /

Weight (in %) **Assessment:**

Kratka seminarska naloga in njena predstavitev Pisni izpit	50 / 50	Short written seminar and its presentation Written exam
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Reference nosilca / Lecturer's references:

CULVER, David C., PIPAN, Tanja. The biology of caves and other subterranean habitats, (Biology of habitats). 2nd ed. New York: Oxford University Press, 2019. XX, 301 str., ilustr. ISBN 978-0-19-882076-5. ISBN 978-0-19-882077-2. [COBISS.SI-ID 44574765]

PIPAN, Tanja, CHRISTMAN, Mary, CULVER, David C. Abiotic community constraints in extreme environments : epikarst copepods as a model system. Diversity. 2020, vol. 12, iss. 7, 16 str. ISSN 1424-2818. <https://www.mdpi.com/1424-2818/12/7/269>, DOI: 10.3390/d12070269. [COBISS.SI-ID 22691331]

MAMMOLA, Stefano, MEIERHOFER, Melissa B., BORGES, Paulo A. V., COLADO, Raquel, CULVER, David C., DEHARVENG, Louis, DELIĆ, Teo, DI LORENZO, Tiziana, DRAŽINA, Tvrtko, FERREIRA, Rodrigo L., FIŠER, Cene, PIPAN, Tanja, ZAGMAJSTER, Maja, ZAKŠEK, Valerija, et al. Towards evidence-based conservation of subterranean ecosystems. Biological reviews. 2022, vol. 97, issue 4, str. 1476-1510, ilustr., graf. prikazi. ISSN 1464-7931. <https://onlinelibrary.wiley.com/doi/10.1111/brv.12851>, DOI: 10.1111/brv.12851. [COBISS.SI-ID 102685955]

PIPAN, Tanja, CULVER, David C. Epikarst : an important aquatic and terrestrial habitat. V: MEHNER, Thomas (ur.), TOCKNER, Klement (ur.). Encyclopedia of inland waters. 2nd ed. Amsterdam; Oxford; Cambridge: Elsevier, 2022. Str. 437-448, ilustr. ISBN 978-0-12-819166-8, ISBN 978-0-12-822041-2. <https://www.sciencedirect.com/science/article/pii/B9780128191668000761>, DOI: 10.1016/B978-0-12-819166-8.00076-1. [COBISS.SI-ID 120285699]

CULVER, David C., KOWALKO, Johanna E., PIPAN, Tanja. Natural selection versus neutral mutation in the evolution of subterranean life : a false dichotomy. Frontiers in ecology and evolution. 2023, vol. 11, [article no.] 1080503, str. 1-10. ISSN 2296-701X. <https://www.frontiersin.org/articles/10.3389/fevo.2023.1080503/full>, DOI: 10.3389/fevo.2023.1080503. [COBISS.SI-ID 141866499]