Univerza v Mariboru
University of Maribor

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

OPIS PREDMETA / SUBJECT SPECIFICATION	
Predmet:	**Izbrana poglavja iz ekologije krasa**
Subject Title:	**Selected Topics in Karst Ecology**

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Doktorski študij Ekološke znanosti / Doctoral Study Ecological Sciences		Izbirni 1 ali 2 ali 3	**2 ali 3 ali 4 ali 5**

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
5				5	140	**5**

Nosilec predmeta / Lecturer: Tanja PIPAN

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

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Poznavanje organizmov in ekologije na ravni univerzitetnega programa	Knowledge of organisms and ecology at graduate level

Vsebina:	**Contents (Syllabus outline):**
Obravnavana so izbrana poglavja iz naslednjih sklopov. Kras prekriva 10 do 15 odstotkov Zemeljine površine. Poznani in opisani so različni tipi kraških ekosistemov (npr. presihajoča jezera) ter podzemeljskih habitatov, npr. ponikalnice, globinske vode v freatični coni kraškega vodonosnega sistema ter ekotoni habitati (epikras, hipotelminorejik). Slušatelji se bodo seznanili z osnovami ekologije krasa, biologijo kraških površinskih in podzemeljskih habitatov ter z biodiverziteto teh habitatov. Spoznali bodo biotske procese, značilne za kraške ekosisteme, vključno s procesi evolucije in adaptacije, kolonizacije in speciacije, vir energije v podzemeljskih habitatih, ekologijo združb, biogeografijo ter naravovarstvo.	Selected topics in the following chapters are discussed. Karst terrain covers about 10 to 15 percent of the terrestrial Earth surface. Many different types of karst ecosystems and subterranean habitats have been described and sampled. Prominent among these are intermittent lakes, underflow streams, deep aquifers, and ecotones (epikarst, hypotelminorheic habitats). Students will be introduced into karst ecology, biology of karst epigean and subterranean habitats and their biodiversities. A range of biotic processes, including evolution and adaptation, colonization and speciation, ecosystem function, sources of energy in subterranean habitats, community ecology, biogeography, and nature conservation will be disscussed.

Temeljni študijski viri / Textbooks:

- Chapman, P., 1993: Caves and cave life. Harper Collins, London.
- Culver, D. C., T. C. Kane, D. W. Fong, 1995: Adaptation and Natural Selection in Caves. The Evolution of *Gammarus minus*. Harvard Univ. Press, Cambridge, MA.
- Culver, D. C., W. B. White (eds.), 2005: Encyclopedia of Caves. Elsevier/Academic Press, Burlington, MA.
- Culver, D. C., L. Deharveng, A. Bedos, J. J. Lewis, M. Madden, J.R. Reddell, B. Sket, P. Trontelj, D. White, 2005: The mid-latitude biodiversity ridge in terrestrial cave fauna. Ecography 29:120-128.
- Gibert, J., D. L. Danielopol, J. Stanford (eds.), 1994: Groundwater Ecology. Academic Press, San Diego.
- Gibert, J., J. Mathieu, F. Fournier (eds.), 1997: Groundwater/Surface Water Ecotones: Biological and Hydrological Interactions and Management Options. Cambridge University Press, Cambridge.
- Griffiths, H. I., B. Kryštufek, J. M. Reed (eds.) 2004: Balkan Biodiversity. Pattern and Process in the European Hotspot. Kluwer, Dordrecht, The Netherlands.
- Gunn, J. (ed.), 2004: Encyclopedia of Caves and Karst Science. Fitzroy-Dearborn, New York.

- Jeffery, W. R., 2006: Evolution of eye degeneration in cavefish: the return of pleiotropy. Subterranean Biology 3:1-12.
- Pipan, T., 2005: Epikarst – A Promising Habitat. ZRC Publishing, Karst Research Institute at ZRC-SAZU, Ljubljana, Slovenia.
- Wilkens, H., D. C. Culver, W. F. Humphreys (eds.), 2000: Subterranean Ecosystems. Elsevier, Amsterdam.

Cilji:

- Predstaviti značilnosti izbranih kraških ekosistemov ter podzemeljskih habitatov
- Pojasniti vire energije v izbranih podzemeljskih habitatih
- Predstaviti biodiverziteto v izbranih kraških habitatih
- Podrobno pojasniti biotske interakcije in strukturo združb
- Podrobno predstaviti prilagoditve za življenje v podzemlju
- Podrobno pojasniti naseljevanje in nastajanje novih vrst v podzemlju
- Podrobno podati geografijo podzemeljske favne jam
- Podrobno predstaviti varovanje in zaščito kraškega okolja

Objectives:

- To present special characteristics of selected karst ecosystems and subterranean habitats
- To explain sources of energy in selected subterranean environments
- To present biodiversity of selected karst habitats
- To explain in detail biotic interactions and community structure
- To present in detail adaptations to subterranean habitats
- To explain in detail colonization and speciation in subterranean environments
- To give in detail geography of cave biodiversity
- To present in detail conservation and protection of karst environments

Predvideni študijski rezultati:

Znanje in razumevanje:

- Podrobno poznavanje kologije kraških ekosistemov in podzemeljskih habitatov ter njihova biodiverziteta
- Podrobno poznavanje biotskih procesov v kraških ekosistemih
- Podrobno poznavanje ekologije in biogeografije podzemeljskih združb
- Podrobno poznavanje trajnostnega razvoja na krasu

Prenesljive/ključne spretnosti in drugi atributi:

- Vrhunska usposobljenost za analitično vrednotenje in interpretiranje kraških ekosistemov
- Podrobno razumevanje energijskih, strukturnih in funkcionalnih povezanosti med komponentami kraških ekosistemov ter posledice antropogenega vpliva

Intended learning outcomes:

Knowledge and Understanding:

- Advanced knowledge of ecology of karst ecosystems and subterranean habitats and biodiversity
- Advanced knowledge of karst ecosystem functioning
- Advanced knowledge of community ecology and biogeography of the hypogean communities
- Advanced knowledge of sustainable development in karst regions

Transferable/Key Skills and other attributes:

- Top-level capability of analytical assessment and interpretation of karst ecosystems
- Advanced understanding of energetic, structural and functional relations between ecosystem components and anthropogenic impact

Metode poučevanja in učenja:

- Predavanja
- Laboratorijske vaje
- Terenske vaje
- Individulano načrtovanje izbrane raziskave

Learning and teaching methods:

- Lectures
- Laboratory excersises
- Field excersises
- Individual planning of a selected investigation

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
• Individualni projekt • Ustni ali pisni izpit	50 % 50 %	• Individual project • Oral or written exam

Materialni pogoji za izvedbo predmeta :

Material conditions for subject realization

• *Multimedijska predavalnica* • *Laboratorij z mikroskopi, binokularnimi lupami in kemijskim instrumentarijem* • *Ekskurzije na terenu*	• *Lecture hall for multimedia presentations* • *Laboratory with microscopes, binocular lenses and chemical instruments* • *Field excursions*
Obveznosti študentov:	***Students' commitments:***
(pisni, ustni izpit, naloge, projekti)	*(written, oral examination, coursework, projects):*
• Individualni projekt • Ustni ali pisni izpit	• Individual project • Oral or written exam