

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	OSNOVE EKOLOGIJE
Course title:	FUNDAMENTALS OF ECOLOGY

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Vede o Zemlji in okolju, magistrski študij 2. stopnje	Biodiverziteta, ekologija in evolucija	1	2
Earth and Environmental Sciences, Master study 2nd level	Biodiversity, ecology and evolution	1	2

Vrsta predmeta / Course type Obvezni/Mandatory

Univerzitetna koda predmeta / University course code: MTB01

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
50	30	10			135	9

Nosilec predmeta / Lecturer: Tanja Pipan

Jeziki / Predavanja / Lectures: angleščina, angleščina / Slovenian, English
Languages: Vaje / Tutorial: angleščina, angleščina / Slovenian, English

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

Končan študijski program 1. stopnje ali dodiplomski študijski program za pridobitev univerzitetne izobrazbe, sprejet pred 11. 6. 2004 s področja naravoslovja.

Prerequisites:

First-cycle Bologna degree or a university degree in the natural sciences.

Vsebina:

- Ekologija ekosistemov
- Diverziteta vrst in ekosistemov, genetska diverziteta; vzorci diverzitete
- Populacije in združbe
- Biotski procesi in biološke analize, biogeokemični cikli
- Trofični odnosi
- Pretok energije in kroženje snovi
- Bruto in neto primarna proizvodnja, sekundarna proizvodnja

Content (Syllabus outline):

- Ecology of ecosystems
- Species, ecosystem, and genetic diversity; diversity patterns
- Populations and communities
- Biotic processes and biological analyses, biogeochemical cycles
- Trophic relations
- Energy flow and nutrient cycles
- Gross and net primary productivity, secondary productivity

- Monitoring vod in ekološke metode ocenjevanja kakovosti vod
- Indikatorski organizmi, okoljske spremenljivke
- Invazivne vrste
- Ohranjanje biotske raznovrstnosti: varovanje ekosistemov, upravljanje ekosistemov, upravljanje populacij
- Človeški dejavniki (socialni dejavniki, ekonomija, politika in ukrepi)
- Degradacija ter izguba ekosistemov
- Varstvena in ekološka biogeografija
- Ekosistemske storitve

- Monitoring of waters and ecological methods for assessment of water quality
- Indicator organisms, environmental monitors
- Invasive species
- Biodiversity conservation: ecosystem protection, ecosystem and population management
- Human impact (social, economic, policy and measures)
- Degradation and loss of ecosystems
- Conservation and ecosystem biogeography
- Ecosystem services

Temeljni literatura in viri / Readings:

- Odum, E. P., & Barrett G. W. 2005: Fundamentals of Ecology. 5th edition. Cengage. Izbrana poglavja.
- Smith, T. S., & Smith R. L., 2013: Elements of Ecology. 8th edition. International edition, Benjamin Cummings, San Francisco, Boston. Izbrana poglavja.
- Tarman, K., 1992: Osnove ekologije in ekologije živali. DZS, Ljubljana, p. 493.
- Tome, D. 2006: Ekologija. Tehniška založba Slovenije, Ljubljana, p. 330.
- Izbrani članki iz znanstvenih revij. / Selected articles from scientific journals.

Cilji in kompetence:

Osnovni cilj predmeta je podati študentom celostno razumevanje vzajemno neločljivih snovnih, energijskih in informacijskih povezav med abiotskimi in biotskimi dejavniki okolja. Poudarek je na strukturni, prostorski in časovni dinamiki znotraj posameznega ekološkega nivoja in med posameznimi nivoji.

Objectives and competences:

The primary goal of this course is to equip students with comprehensive understanding of the mutually inseparable material, energy and information interactions between abiotic and biotic environmental elements. Emphasis is placed on the structural, spatial and temporal dynamics within each ecological level and among different levels.

Predvideni študijski rezultati:

Študenti bodo pridobili znanje o posameznih ekoloških sistemih, od vrste do ekosistema, sposobni bodo povezovati različne nivoje biotskih sistemov tako, da prepoznajo odzive ekoloških sistemov na spremembe v okolju. Razumeli bodo energijske, strukturne in funkcionalne povezanosti med komponentami ekosistemov ter posledice antropogenega vpliva. Spoznali bodo osnovne ekološke raziskovalne metode, razvili kritičen odnos do problemov degradacije in onesnaženosti ekosistemov, ter vplive na organizme. Študenti bodo pridobili znanje za razvoj sonaravnega in trajnostnega ravnanja z ekološkimi sistemi.

Intended learning outcomes:

Students will gain the knowledge of individual ecological systems, from species to ecosystem; they will learn to connect different levels of biotic systems in the way that they identify responses of ecological systems to changes in the environment. Students will understand energetic, structural and functional relations between ecosystem components and anthropogenic impact. They will become familiar with the basic selected ecological research methods, understand the problems of degradation and pollution of ecosystems as well as threats to organisms, and will understand the principles of nature protection. Students will

Sposobni bodo pridobili izkušnje s samostojno izvedbo izbrane raziskovalne naloge s področja ekologije, analize pridobljenih podatkov in predstavitve rezultatov.

obtain knowledge for development of sustainable management with ecological systems. Student will gain experiences through an independent research project in ecology, data analysis and results interpretation.

Metode poučevanja in učenja:

- Predavanja
- Individualno delo na izbrani raziskavi in predstavitev v seminarski obliki

Learning and teaching methods:

- Lectures
- Individual work of a selected investigation and presentation as a seminar work

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment
• Kratka seminarska naloga, njena predstavitev	50%	• Short written seminar and its presentation
• Izpit	50%	• Examination

Reference nosilca / Lecturer's references:

1. **Pipán, T.**, Christman, M., Culver, D. C. (2020). Abiotic community constraints in extreme environments : epikarst copepods as a model system. *Diversity*, 12(7), 16 str.
2. Kozel, P., **Pipán, T.** (2020). Specialized aquatic subterranean communities are probably most species-rich in the thickest epikarst. *Limnologica*, 81, 1-9.
3. Pilotto, F., Kühn, I., Adrian, R., Alber, R., Alignier, A., Andrews, C., Bäck, J., Barbaro, L., Beaumont, D., Beenaerts, N., **Pipán, T.**, et al. (2020). Meta-analysis of multidecadal biodiversity trends in Europe. *Nature communications*, 11, 11 str.
4. Culver, D. C., & **Pipán, T.** (2019). *The biology of caves and other subterranean habitats*. Oxford University Press, USA.
5. **Pipán, T.**, Petrič, M., Šebela, S., & Culver, D. C. (2019). Analyzing climate change and surface-subsurface interactions using the Postojna Planina Cave System (Slovenia) as a model system. *Regional environmental change*, 19(2), 379-389.
6. Mammola, S., Piano, E., Cardoso, P., Vernon, P., Domínguez-Villar, D., Culver, D. C., **Pipán, T.**, Isaia, M. (2019). Climate change going deep : the effects of global climatic alterations on cave ecosystems. *The anthropocene review*, 2019, 19 str.
7. Culver, D. C., & **Pipán, T.** (2019). *The biology of caves and other subterranean habitats*. Oxford University Press, USA.
8. **Pipán, T.**, Culver, D. C., Papi, F., & Kozel, P. (2018). Partitioning diversity in subterranean invertebrates : the epikarst fauna of Slovenia. *PLoS one*, 13(5), 1-19.
9. Culver, D. C., & **Pipán, T.** (2014). *Shallow subterranean habitats: ecology, evolution, and conservation*. Oxford University Press.
10. Culver, D. C., **Pipán, T.**, & Schneider, K. (2009). Vicariance, dispersal and scale in the aquatic subterranean fauna of karst regions. *Freshwater Biology*, 54(4), 918-929.