



Univerza v Mariboru

Fakulteta za naravoslovje  
in matematiko

### UČNI NAČRT PREDMETA / COURSE SYLLABUS

<b>Predmet:</b>	<b>Prostorsko modeliranje v ekologiji</b>
<b>Course title:</b>	<b>GIS-based Modeling in Ecology</b>

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.- 4.; 1st-4th
Doctoral Study Ecological Sciences, 3rd degree			

Vrsta predmeta / Course type: Izbirni/Elective

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
10	5		15		150	6

Nosilec predmeta / Lecturer: Danijel Ivajnšič

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

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti: Jih ni.  
Prerequisites: None.

Vsebina:	Content (Syllabus outline):
<ul style="list-style-type: none"><li>Geografski informacijski sistemi in prostorski podatki v ekologiji</li><li>Uporaba rastrskih in vektorskih podatkov v prostorski analizi in ekološkem modeliranju</li><li>Primeri uporabe prostorskih modelov v ekologiji</li><li>Interpretacija in vizualizacija rezultatov prostorskega modeliranja</li></ul>	<ul style="list-style-type: none"><li>Geographic information systems and geospatial datasets in ecology</li><li>The use of raster and vector data in ecological spatial analysis and modeling</li><li>Ecological modeling key studies</li><li>Interpretation and visualization of geospatial modeling results</li></ul>

**Temeljni literatura in viri / Readings:**

- Bai, T., 2017: GIS technology applications in environmental and earth sciences. Taylor & Francis; CRC Press. (izbrana poglavja)
- Skidmore, A., 2002: Environmental Modelling with GIS and Remote Sensing (Geographic Information Systems Workshop), CRC Press. (izbrana poglavja)
- Goodchild, M.F., Case, T.J., 2014: Spatial Uncertainty in Ecology: Implications for Remote Sensing and GIS Applications. Springer-Verlag Ney York. (izbrana poglavja)
- Ciglič, R., Geršič, M., Perko, D., Zorn, M., 2016: GIS v Sloveniji 13: Digitalni podatki, Geografski inštitut Antona Melika ZRC SAZU. Ljubljana. (izbrana poglavja)
- Ivajnsič D., in sod. 2023. Primeri prostorskih analiz vplivov podnebnih sprememb: Monografija v okviru projekta Preprečevanje toplotnega stresa v urbanih sistemih v luči podnebnih sprememb (ARRS J7-1822). DOI: <https://doi.org/10.18690/um.fnm.8.2022>

**Cilji in kompetence:**

- Študentje pojasnijo tehnologijo GIS in povežejo le-to z statističnimi metodami.
- Študentje uporabijo rastrske in vektorske podatke z vidika prostorske analize in modeliranja v ekologiji.
- Študentje uporabijo različne prakse ekološkega modeliranja.
- Študentje predstavijo rezultate z različnimi tematskimi kartami in z modelom ustreznimi diagrami.

**Objectives and competences:**

- Students explain GIS technology and link it with statistical methods.
- Students use raster and vector data from the perspective of spatial analysis and modeling in ecology.
- Students use various ecological modeling practices.
- Students present results with different thematic maps and model relevant diagrams.

**Predvideni študijski rezultati:****Znanje in razumevanje:**

- Študentje poiščejo in uporabljajo dostopne prostorske podatkovne baze
- Študentje uporabljajo GIS orodja za prostorsko analizo in modeliranje v ekologiji.

**Prenesljive/ključne spretnosti in drugi atributi:**

- Študentje uporabljajo različna GIS orodja in prostorske podatke za potrebe prostorske analize in modeliranja v ekologiji.

**Metode poučevanja in učenja:****Intended learning outcomes:****Knowledge and understanding:**

- Students find and use accessible spatial databases
- Students use GIS tools for spatial analysis and modeling in ecology.

**Transferable/Key Skills and other attributes:**

- Students use different GIS tools and spatial data for the needs of spatial analysis and modeling in ecology.

**Learning and teaching methods:**

<ul style="list-style-type: none"> <li>• Predavanja</li> <li>• Seminar</li> <li>• Laboratorijske vaje</li> <li>• Individualno delo</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Seminar</li> <li>• Laboratory work</li> <li>• Individual work</li> </ul>
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Delež (v %) /

**Načini ocenjevanja:**

Weight (in %)

**Assessment:**

<ul style="list-style-type: none"> <li>• Seminarska naloga</li> <li>• Pisni izpit</li> </ul>	<p>20%</p> <p>80%</p>	<ul style="list-style-type: none"> <li>• Seminar</li> <li>• Written exam</li> </ul>
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**Reference nosilca / Lecturer's references:**

- IVAJNŠIČ, Danijel, DEVETAK, Dušan. GIS-based modelling reveals the fate of antlion habitats in the Deliblato Sands. *Scientific reports*. 2020, vol. 10, art. no. 5299, str. 1-9. ISSN 2045-2322. DOI: [10.1038/s41598-020-62305-3](https://doi.org/10.1038/s41598-020-62305-3). [COBISS.SI-ID [16499971](https://www.cobiss.si/id/16499971)]
- IVAJNŠIČ, Danijel, PIPENBAHER, Nataša, GRUJIĆ, Jaša Veno, DONŠA, Daša, KALIGARIČ, Mitja, ŠKORNIK, Sonja, ŽIBERNA, Igor, ČUŠ, Jure, RECKO NOVAK, Petra, KOHEK, Štefan, BRUMEN, Matej, STRNAD, Damjan. A decision support system for effective implementation of agro-environmental measures targeted at small woody landscape features : the case study of Slovenia. *Landscape and urban planning*. [Print ed.]. 2024, vol. 247, [article no.] 105064, 13 str., ilustr. ISSN 0169-2046. DOI: 10.1016/j.landurbplan.2024.105064. [COBISS.SI-ID 190421251]
- ŽIBERNA, Igor, PIPENBAHER, Nataša, DONŠA, Daša, ŠKORNIK, Sonja, KALIGARIČ, Mitja, KAJFEŽ-BOGATAJ, Lučka, ČREPINŠEK, Zalika, GRUJIĆ, Jaša Veno, IVAJNŠIČ, Danijel. The impact of climate change on urban thermal environment dynamics. *Atmosphere*. 2021, vol. 12, iss. 9, str. 1-15, ilustr. ISSN 2073-4433. [https://www.mdpi.com/journal/atmosphere/special\\_issues/hazards\\_urbanization\\_climate](https://www.mdpi.com/journal/atmosphere/special_issues/hazards_urbanization_climate), [Repozitorij Univerze v Ljubljani – RUL](https://www.repositorij.uni-lj.si/), [Digitalna knjižnica Univerze v Mariboru – DKUM](https://www.dkum.si/), DOI: [10.3390/atmos12091159](https://doi.org/10.3390/atmos12091159). [COBISS.SI-ID [75887619](https://www.cobiss.si/id/75887619)]