

**UČNI NAČRT PREDMETA/COURSE SYLLABUS**

Predmet:	NAPREDNI GEOGRAFSKI INFORMACIJSKI SISTEMI
Course title:	ADVANCED GEOGRAPHIC INFORMATION SYSTEMS

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
LOGISTIKA SISTEMOV 2.stopnja		1.	1
SYSTEM LOGISTICS 2 <sup>nd</sup> degree		1.	1.

Vrsta predmeta / Course type: OBVEZNI

Univerzitetna koda predmeta / University course code: MAG

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Laboratory work	Druge oblike študija Field work	Samost. delo Individ. work	ECTS
24 e-P 21 a-P		19 e-V 21 a-V			155	8

Nosilec predmeta / Lecturer: KLEMEN PRAH

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

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti: Ni pogojev. Prerequisites: None.

Vsebina: Content (Syllabus outline):

- *Prostorski podatki*
- *Podatkovni sloji*
- *Simbologija*
- *Labeliranje*
- *Koordinatni sistemi in projekcije*
- *Izdelava karte*
- *Upravljanje s tabelami*
- *Urejanje Prostorske podatkovne baze*
- *Lokacije iz atributov*
- *Reševanje prostorskih problemov*
- *Prilagajanje ArcMap-a*
- *Polnjenje prostorske podatkovne zbirke*
- *Obnašanje podatkovnih zbirk*
- *Urejanje GIS podatkov*
- *Geoprocesiranje*
- *Orodja za geoprocesiranje*
- *Analiza GIS podatkov*
- *Analize z Model Builder-jem*
- *Analitični GIS projekti*

- *Spatial data*
- *Data layers*
- *Symbols*
- *Labelling*
- *Coordination systems and projections*
- *Map production*
- *Managing tables*
- *Managing spatial databases*
- *Attribute locations*
- *Solving spatial problems*
- *Adjusting of ArcMap*
- *Spatial data collection*
- *Managing databases*
- *Managing GIS data*
- *Geoprocessing*
- *Geoprocessing tools*
- *GIS data analysis*
- *Model Builder analysis*
- *Analytical GIS projects*

ArcGIS Desktop programsko okolje je integriran sistem, ki vključuje vsa potrebna orodja za učinkovito uporabo geografskih informacijskih sistemov. Pri predmetu GIS 2 se naučimo uporabljati spekter funkcionalnosti in orodij za vizualizacijo, upravljanje in analizo prostorskih

ArcGIS desktop software is an integrated system which includes all tools necessary for an efficient use of GIS. During the GIS 2 module students will learn to use the tools for visualisation, management and analysis of spatial data.

podatkov. Z vajami se naučimo uporabe aplikacij ArcCatalog in ArcMap. Poudarek je na orodjih za izdelavo in upravljanje prostorskih podatkov, prikaza podatkov na kartah ter primerjavo in analizo podatkov z različnimi vzorci in relacijami.

V drugem delu predmeta se seznanimo z uporabo ArcGIS orodij v delovnem procesu, s poudarkom na delovnih procesih, pri katerih imamo podatke shranjene v prostorskih zbirkah, ter geoprocesiranju in analizi. Pri vajah bomo organizirali in urejali podatke shranjene v prostorskih podatkovnih zbirkah, jih pripravili za analize, kreirali in urejali geoprocesne modele z uporabo ModelBuilder-ja in delali na zahtevnih analitičnih projektih.

During tutorials ArcCatalog and ArcMap applications will be used. Emphasis will be on tools for making and managing spatial data, displaying data on maps and comparing and analysing data using various patterns and relations.

Second part of the course features ArcGIS tools application in the work process, whereby data is saved in spatial databases, and geoprocessing and analysis. During tutorials, students will organize and manage data saved in spatial databases, analyse, create and manage geoprocessing models using ModelBuilder and work on other analytical projects.

#### Temeljna literatura in viri / Readings:

E-gradivo predmeta.

The ESRI Guide to GIS Analysis Volume 1: Geographic Patterns & Relationships by Andy Mitchell (Paperback - Aug 1, 1999).

The ESRI Guide to GIS Analysis: Volume 2: Spatial Measurements and Statistics by Andy Mitchell (Paperback - Jul 1, 2005).

GIS for the Urban Environment by Juliana Maantay, John Ziegler, and John Pickles (Hardcover - Jul 1, 2006).

#### Cilji in kompetence:

- Dodajanje podatkov v podatkovne zbirke
- Kreiranje podtipov in uporaba pri urejanju
- Preverjanje pravilnosti geometrije in atributov
- Urejanje s pomočjo topologije
- Kreiranje in urejanje anotacij
- Kreiranje in urejanje metapodatkov
- Kreiranje svojih simbolov
- Kreiranje in uporaba predlog
- Uporaba analitičnih orodij (pogovorna okna, modeli)
- Razumevanje shranjevanja GIS podatkov v podatkovnih bazah
- Ustvarjanje in urejanje objektov v prostorskih podatkovnih bazah
- Prikazovanje podatkov
- Klasifikacija in simbologija podatkov
- Prikazovanje napisov na kartah
- Spreminjanje koordinatnega sistema in projekcije
- Dostopanje do atributnih podatkov
- Poizvedovanje in analiza GIS podatkov
- Izvedba preprostega modela za avtomatizacijo GIS analitičnega postopka
- Izdelava poročil in grafov

#### Objectives and competences:

- Adding data to databases
- Creating subtypes and editing
- Proofing geometrical correctness and attributes
- Managing by using topology
- Creating and managing annotation
- Creating and managing metadata
- Creating personal symbols
- Creating and using forms
- Applying analytical tools
- Understanding how GIS data is saved in databases
- Creating and editing objects in spatial databases
- Depicting data
- Classifying signs on maps
- Presenting annotation on maps
- Altering coordination systems and projections
- Accessing attribute data
- GIS analysis and data mining
- Implementation of a simple model for an automation of a GIS analytical process
- Producing reports and graphs

#### Predvideni študijski rezultati:

Študent se nauči upravljati zahtevnejše GIS analize, potrebne pri reševanju različnih logističnih problemov. Nauči se uporabljati funkcionalnosti GIS programske opreme pri raziskovalnem delu.

#### Intended learning outcomes:

Students learn to conduct advanced GIS analyses, needed for solving various logistics problems. They learn to use GIS software for their research work.

Prenesljive/ključne spretnosti in drugi atributi:  
Študent se nauči uporabljati GIS analize pri reševanju logističnih problemov, definiranih pri večini ostalih predmetov na dodiplomskem in podiplomskem študiju na FL.

Transferable/Key Skills and other attributes:  
Students learn to apply GIS analysis when solving logistic problems, defines in most undergraduate and graduate modules at the Faculty of Logistics

Metode poučevanja in učenja:

Predavanja: pri predavanjih študent spozna teoretične vsebine predmeta. Del predavanj se izvaja na klasični način v predavalnici, del pa v obliki e-predavanj (e-predavanja se lahko izvajajo na videokonferenčni način ali s pomočjo posebej v ta namen didaktično pripravljenih e-gradiv v virtualnem elektronskem učnem okolju).

Vaje: pri vajah študent utrdi teoretično znanje in spozna aplikativne možnosti. Del vaj se izvaja na klasični način v predavalnici, del pa v obliki e-vaj (e-vaje se lahko izvajajo na videokonferenčni način ali s pomočjo posebej v ta namen didaktično pripravljenih e-gradiv v virtualnem elektronskem učnem okolju).

Learning and teaching methods:

Lectures: Students understand the theoretical frameworks of the course. Part of the lecture course is in a classroom while the rest is in the form of e-learning (e-lectures may be given via video-conferencing or with the help of specially designed e-material in a virtual electronic learning environment).

Tutorials: Students enhance their theoretical knowledge and are able to apply it. Part of the seminar is in a classroom while the rest is in the form of e-learning (e-tutorials may be given via video-conferencing or with the help of specially designed e-material in a virtual electronic learning environment).

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Opravljene obveznosti e-predavanj in e-vaj so pogoj za pristop k izpitu.		Successful completion of e-lectures and e-tutorials is a prerequisite for entering the exam.
Pisni izpit.	70%	Written exam.
Seminarska naloga.	30%	Seminar paper .

Reference nosilca / Lecturer's references:

1. KRAMBERGER, Tomaž, DRAGAN, Dejan, PRAH, Klemen. A heuristic approach to reduce carbon dioxide emissions. Proceedings of the Institution of Civil Engineers - Transport, ISSN 0965-092X. [Print ed.], Okt. 2014, vol. 167, iss. 5, str. 296-305. <http://www.icevirtuallibrary.com/content/article/10.1680/tran.11.00053>, doi: 10.1680/tran.11.00053. [COBISS.SI-ID 512554557]
2. KRAMBERGER, Tomaž, ŽEROVNIK, Janez, ŠTRUBELJ, Gregor, PRAH, Klemen. GIS technology as an environment for testing an advanced mathematical model for optimization of road maintenance. Central European Journal of Operations Research, ISSN 1435-246X, June 2013, vol. 21, issue 1-Supplement, str. 59-73, doi: 10.1007/s10100-012-0265-4. [COBISS.SI-ID 512429885]
3. PRAH, Klemen. Opportunities for incorporating geography into the river basin management. Dela, ISSN 0354-0596. [Tiskana izd.], 2012, [Št.] 37, str. 27-43, ilustr. <http://revije.ff.uni-lj.si/Dela/article/view/dela.37.2.27-43/719>, doi: 10.4312/dela.37.2.27-43. [COBISS.SI-ID 51077218]
4. DRAGAN, Dejan, KRAMBERGER, Tomaž, PRAH, Klemen. Transport optimization and estimation of reduced CO2 emissions. V: KRAMBERGER, Tomaž (ur.), POTOČAN, Vojko (ur.), IPAVEC, Vesna Mia (ur.). Sustainable logistics and strategic transportation planning, (Advances in logistics, operations, and management science book series (Print), ISSN 2327-350X). Hershey: IGI Global. cop. 2016, str. 405-436, ilustr. <http://www.igi-global.com/book/sustainable-logistics-strategic-transportation-planning/141939>, doi: 10.4018/978-1-5225-0001-8.ch019. [COBISS.SI-ID 512762429]
5. KRAMBERGER, Tomaž, ŽEROVNIK, Janez, ŠTRUBELJ, Gregor, PRAH, Klemen. Contribution to environmentally friendly winter road maintenance. Harlow [etc.]: Pearson Education, cop. 2015. IX, 120 str., ilustr. ISBN 978-1-78447-720-2. [COBISS.SI-ID 512610621]
6. KRAMBERGER, Tomaž, RUPNIK, Bojan, ŠTRUBELJ, Gregor, PRAH, Klemen. Port hinterland modelling based on port choice. Promet, ISSN 0353-5320. [Print ed.], 2015, vol. 27, no. 3, str. 195-203, ilustr. <http://www.fpz.unizg.hr/traffic/index.php/PROMTT/article/view/1611>, doi: 10.7307/ptt.v27i3.1611. [COBISS.SI-

ID 512689725]

7. PRAH, Klemen, LISEC, Andrej, LISEC, Anka. Digital spatial data as support for river basin management : the case of Sotla river basin. *Spatium : urban and spatial planning, architecture, housing, building, geodesia, environment*, ISSN 1450-569X, 2013, iss. 29, str. 59-67, doi: 10.2298/SPAT1329059P. [COBISS.SI-ID 512519485]
8. DRAGAN, Dejan, VIZINGER, Tea, INTIHAR, Marko, KRAMBERGER, Tomaž, FOŠNER, Maja, PRAH, Klemen. Reconstruction of delivery positions in the city of Celje, Slovenia. *Transport problems : international scientific journal*, ISSN 1896-0596. [Printed ed.], 2013, vol. 8, iss. 2, str. 11-24.  
[http://www.transportproblems.polsl.pl/pl/Archiwum/2013/zeszyt2/2013t8z2\\_02.pdf](http://www.transportproblems.polsl.pl/pl/Archiwum/2013/zeszyt2/2013t8z2_02.pdf). [COBISS.SI-ID 512516157]