

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Ime predmeta:	OSNOVE PROSTORSKEGA MODELIRANJA
Course title:	BASICS OF SPATIAL MODELLING

Študijski program in stopnja Study programme and cycle	Študijska smer Study option	Letnik Year of study	Semester Semester
GOSPODARSKA IN TEHNIŠKA LOGISTIKA 1. stopnja		2.	3.
PROFESSIONAL HIGHER EDUCATION STUDY PROGRAMME ECONOMIC AND TECHNICAL LOGISTICS 1 st degree		2.	3.

Vrsta predmeta (obvezni ali izbirni) / Course type (compulsory or elective)	OBVEZNI
	COMPULSORY

Univerzitetna koda predmeta / University course code:	VS
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Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Clinical training	Druge oblike študija Other forms of study	Samost. delo Individual work	ECTS
15 e-P 15 a-P		18 e-V 27 a-V			135	7

Nosilec predmeta / Course coordinator:	TOMAŽ KRAMBERGER
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Jeziki /Languages:	Predavanja / Lectures:	SLOVENSKI/SLOVENE
	Vaje / Tutorial:	SLOVENSKI/ SLOVENE

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites for enrolling in the course or for performing study obligations:
Ni pogojev.	None.

Vsebina (kratek pregled učnega načrta):	Content (syllabus outline):
<ul style="list-style-type: none"> • Osnove matematičnega modeliranja logističnih procesov. • Osnove teorije grafov kot orodje za modeliranje. • Algoritmi za optimizacijo logističnih modelov. • Teoretično – metodološke osnove GIS-a. • Aplikacija modelov in njihova optimizacija v GIS-u. 	<ul style="list-style-type: none"> • Basics of mathematical modelling of logistics processes. • Basics of graph theory as a tool for modelling. • Algorithms for optimisation of logistics models. • Theoretic-methodological basics of GIS. • Model application and their optimisation in GIS.

Temeljni literatura in viri / Reading materials:
<ul style="list-style-type: none"> • E-gradivo predmeta. • Kvamme K., Oštir-Sedej, K., Stančič, Z., Šumrada, R., 1997. Geografski informacijski sistemi. Znanstvenoraziskovalni center Slovenske akademije znanosti in umetnosti Ljubljana, 19-21.

- Wilson, R.J., Watkins, J.J., Graphs, An introductory approach, John Wiley, New York, 1990. (Slovene translation: Uvod v teorijo grafov, DMFA Ljubljana 1997.)
- Understanding GIS: The ARC/INFO Method, Esri Press; Book & CD edition, 1999.

Cilji in kompetence:

Študenti:

- spoznajo osnove modeliranja logističnih procesov, izgradnjo modelov in njihovo optimizacijo,
- spoznajo osnovna matematična orodja za modeliranje in se naučijo izgraditi modeli enostavnih logističnih procesov,
- spoznajo osnove Geografskih informacijskih sistemov in njihovo uporabo v logistiki, naučijo se aplicirati izgrajene modeli v GIS-u.

Objectives and competences:

Students:

- are familiarized with the basics of modelling logistics processes and their optimization,
- are familiarized with the basic mathematical tools for modelling and learn to create models for simple logistics processes,
- learn about the basics of GIS and their use in logistics, they learn to apply their models to practical situations using GIS.

Predvideni študijski rezultati:

Študenti znajo:

- pojasniti vlogo in pomen GIS modeliranja v logistiki,
- opredeliti namen in osnove GIS-a,
- spoznajo osnove GIS-a,
- uporabiti osnovna orodja GIS-a za modeliranje osnovnih logističnih problemov.

Intended learning outcomes:

Students learn:

- how to explain the role and importance of GIS,
- about the purpose and basics of GIS,
- to get to know the basics of GIS,
- use the basic GIS tools for modelling basic,
- logistics problems.

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 %) / Share (in %)	Assessment methods:
Opravljene obveznosti e-predavanj in e-vaj so pogoj za pristop k izpitu. <ul style="list-style-type: none"> • Pisni izpit. • Ustni izpit. 	70% 30%	Successful completion of e-lectures and e-tutorials is a prerequisite for entering the exam. <ul style="list-style-type: none"> • Written examination. • Oral examination.

Reference nosilca / Course coordinator's references:

1. KRAMBERGER, Tomaž, ŽEROVNIK, Janez. Priority constrained Chinese postman problem. *Logistics and sustainable transport*, 22-05-07, vol. 1, no 1, 15 str.
http://www.jlst.org/uploads/priority_constrained_chinese_postman_kramb.zer.pdf.
2. KRAMBERGER, Tomaž, ROSI, Bojan. Do managers have enough quality information for decision-making. *Organizacija (Kranj)*, sep.-okt. 2007, letn. 40, št. 5, str. 207-217.
3. KRAMBERGER, Tomaž, ŽEROVNIK, Janez. A contribution to environmentally friendly winter road maintenance: : optimizing road de-icing. *Transp. res., Part D Transp. environ..* [Print ed.], July 2008, vol. 13, iss. 5, str. 340-346. <http://dx.doi.org/10.1016/j.trd.2008.03.007>, doi: [10.1016/j.trd.2008.03.007](https://doi.org/10.1016/j.trd.2008.03.007).
4. KRAMBERGER, Tomaž, ŠTRUBELJ, Gregor, ŽEROVNIK, Janez. Chinese postman problem with priority nodes. *Fund. Computing Decis. Sci.*, 2009, vol. 34, no. 4, str. 233-264.
<http://fcds.cs.put.poznan.pl/FCDS2/ArticleDetails.aspx?articleId=218>.
5. FOŠNER, Maja, KRAMBERGER, Tomaž. Logistics as a part of leisure and tourism industry. V: 15th Annual Conference European Council for Business Education, May 28-30, 2010, Lausanne, Switzerland. "Co-operation and competition - in the leisure and service industries" : *proceedings of the 15th Annual Conference European Council for Business Education, May 28-30, 2010, Lausanne, Switzerland*, (ECBE proceedings of the Annual Conference, 2010). Lausanne: European Council for Business Education: = ECBE, 2010, str. 70-78.