

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	UPORABA OPTIMIZACIJSKIH METOD V LOGISTIKI
Course title:	APPLICATION OF OPTIMIZATION TECHNIQUES IN LOGISTICS

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	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 / Course type: OBVEZNI

Univerzitetna koda predmeta / University course code: VS

Predavanja Lectures	Seminar Seminar	vaje Tutorial	Klinične vaje Laboratory work	Druge oblike študija Field work	Samost. delo Individ. work	ECTS
30 e-P 30 a-P		12 e-V 6 a-V	12 LV		150	8

Nosilec predmeta / Lecturer: TOMAŽ KRAMBERGER

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):
<ul style="list-style-type: none"> • Ponovitev osnov matričnega in procentnega računa. Razmerja, razdelilni račun, zmesi račun. Osnove obrestnega računa: navadni obrestni račun, obrestno obrestni račun, vloge in dvigi, posojila. • Sistemi linearnih enačb in neenačb: Ponovitev reševanja sistemov linearnih enačb z več neznankami s pomočjo Gausove eliminacijske metode in matričnih enačb, • reševanje sistemov linearnih neenačb z grafično metodo. • Konveksne množice, določanje ekstremnih točk. • Linearno programiranje: formulacija problema, reševanje na grafični način, reševanje s programskim paketom LINGO. 	<ul style="list-style-type: none"> • Revision of basics of matrix and interest calculations. • Basics of interest calculation types. • Systems of linear equations and inequations: revision (solving linear equations using Gauss elimination method and matrix equations, solving linear inequations using the graph method. • Convex sets, determining extreme points. • Linear programming: problem formulation, solving problems using graphs, solving problems using LINGO software.

Temeljna literatura in viri / Readings: E-gradivo predmeta.
Kramberger, T, M, Kvantitativne metode v logistiki, Fakulteta za logistiko, Celje-Krško, 2008.
Vadnal, A.: Linearno programiranje, Informator, Zagreb, 1977.

Waters. D.: Quantitative Methods for Business, Addison Wesley, Essex, 1997, ISBN: 0-201-403978, COBISS.SI-ID: 9076454.

Čižman, A.: Operacijske raziskave : teorija in uporaba v organizaciji, Kranj, Moderna organizacija, 2003, ISBN: 961-232-162-0, COBISS.SI-ID: 127813888.

Cilji in kompetence:

Študenti:

- spoznajo in se naučijo osnov upravljanja logističnih sistemov spomočjo kvantitativnih metod,
- razumejo koncept operacijskih raziskav in razvijejo sposobnost reševanja problemov v logističnih sistemih z linearnim in celoštevilskim linearnim modelom,
- razvijejo sposobnost interpretacije dobljene rešitve,
- se naučijo na podlagi izbranega kriterija rešitev še izboljšati.

Objectives and competences:

Students:

- are familiarized with and study the basics for managing logistics systems using quantitative methods,
- understand the concept of operational research and develop problem solving skills in logistics systems using linear and whole number linear models,
- develop skills to interpret the gained results,
- learn how to improve results based on the chosen criteria.

Predvideni študijski rezultati:

Znanje in razumevanje:

Študenti:

- spoznajo vrednost uporabe razmerij pri reševanju problemov,
- študenti usvojijo osnovne pojme obrestnega računa,
- naučijo se uporabiti obrestni račun v konkretnih primerih, naučijo se izračunati satnje vlog na dan datum in naučijo se izdelati amortizacijski načrt za odplačilo posojila,
- študenti se naučijo reševati sisteme linearnih neenačb na grafični način,
- se naučijo osnov linearnega programiranja,
- uporabijo linearno programiranje za reševanje osnovnih logističnih problemov,
- študenti se naučijo uporabe programskega paketa LINGO za reševanje linearnih programov.

Prenesljive/ključne spretnosti in drugi atributi:

Študenti se usposobijo za uporabo teoretičnega znanja v praktičnih primerih, predvsem pri procesih, ki so jih spoznali pri predmetih Organizacija procesa oskrbne verige, Ekonomika v logistiki v prvem letnik.

Intended learning outcomes:

Knowledge and understanding:

Students:

- learn about the value of relations when solving problems,
- learn the basics of interest calculations,
- learn how to apply the interest calculation to practical cases and how to work out a depreciation plan,
- learn to solve systems of linear inequations using graphs,
- learn the basics of linear programming,
- learn to use linear programming to solve basic logistics problems,
- learn to use LINGO software to solve linear programmes.

Transferable/Key Skills and other attributes:

Students learn to apply theoretical knowledge to practical situations, especially processes from the following modules: Organization of the Supply Chain Process, Economics in Logistics from year 1.

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

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

namen didaktično pripravljenih e-građiv v virtualnem elektronskem učnem okolju).

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 examination.
Seminarska naloga.	30%	Seminar paper.

Reference nosilca / Lecturer'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.ilst.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.