

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	METODE IN TEHNIKE PLANIRANJA LOGISTIČNIH PROCESOV
Course title:	METHODS AND TECHNICS FOR DESIGN OF LOGISTIC PROCESSES

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
GOSPODARSKA IN TEHNIŠKA LOGISTIKA 1. stopnja		3.	5.
PROFESSIONAL HIGHER EDUCATION STUDY PROGRAMME ECONOMIC AND TECHNICAL LOGISTICS 1 st degree		3.	5.

Vrsta predmeta / Course type

OBVEZNI

Univerzitetna koda predmeta / University course code:

VS

Predavanja Lectures	Seminar Seminar	vaje Tutorial	Laboratory work	Druge oblike študija Field work	Samost. delo Individ. work	ECTS
a-P 30 e-P 15		a-V 21 e-V 9			105	6

Nosilec predmeta / Lecturer:

IZTOK POTRČ

Jeziki /

Predavanja / Lectures: SLOVENSKI / SLOVENE

Languages:

Vaje / Tutorial: SLOVENSKI / SLOVENE

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

Ni pogojev.

Prerequisites:

No special conditions.

Vsebina:

Predavanja:

- Uvodna predstavitev vpliva projektnih parametrov na izbiro sistema sestave.
- Metode in tehnika načrtovanja montažnega sistema (postavitev problema, grobo načrtovanje, fino načrtovanje, realizacija, preskusni zagon).
- Osnovne tehnike montaže in vpliv sistema transporta (oblike postavitve montažnega sistema brez avtomatiziranega toka izdelkov, delno in popolno avtomatizirani sistemi sestave s transportnim in skladiščnim sistemom).
- Pripomočki za načrtovanje sistema sestave (določitev časa takta, določitev števila delovnih mest, določitev vmesnih skladišč, določitev materialnega toka, določitev informacijskih tokov).
- Informacijski tokovi in nosilci informacij (Črna koda, RFID, Pick by light/voice ...).
- Vmesna skladišča (linijsko vm. skladišče, obtočno vm. skladišče, posebni primeri skladiščenja).
- Varnostne zahteve in primeri montažnih celic.

Content (Syllabus outline):

Lectures:

- Introduction on influence of project parameters to assembly.
- Methods and technics for planning of assembly systems (problem determination, rough planning, fine planning, realisation, start-up procedures).
- Basic technics of assembly and montage systems and influence of manner of transportation an material handling system (Assembly and montage systems without automatically material flow, partly- and completely automatic assembly systems with transportation and warehouse systems).
- Shifts for design of assembly systems (determination of assembly rhythm, determination of number of working places, determination of buffers, determination of material and information flow).
- Information flow and information carriers (bar-code, RFID, Pick by light, Pick by voice, ...).
- Buffers (on transportation line buffers, circulation-tipe buffers, special cases of warehousing).
- Safety demands and cases of assembly cells.

Seminar:

Seminar aplikativno dopolnjuje vsebino predavanj s praktičnim reševanjem problemov določanja montažnih sistemov in sistemov sestave.

Seminar:

Seminar (project) work supplement lectures with practical solutions design problems by assembly systems.

Temeljni literatura in viri / Readings:

- E-gradivo predmeta.
- Redford, A., Chal, J. (1994). Design for Assembly. London: Mcgraw-Hill Book Company.
- Baudin, M. (2002). Lean Assembly: The Nuts and Bolts of Making Assembly Operations Flow. Productivity Press.
- Davis R. (2001). Business Process Modeling with Aris. London: Springer.
- Scheer A.W. (1996). Business Process Engineering – Reference models for industrial enterprises. Berlin: Springer-Verlag.
- Konold, P., Reger, H. (1997). Angewandte Montagetechnik. Vieweg Verlag.
- Pfohl, H.C. (2009). Logistiksysteme. Springer Verlag.
- Gajšek, B. (2015). Vitka notranja logistika in osnove planiranja v proizvodnem podjetju: e-gradivo za predmet Metode in tehnike planiranja logističnih procesov. Celje: Faculty of logistics University of Maribor.

Cilji in kompetence:

- Spoznavanje načinov in tehnik sestave in ekonomska upravičenost avtomatizacije sistema sestave.

Objectives and competences:

- Insight into design principles and techniques and economic authorization of the automatisisation of assembly systems.

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

- poznavanje specialnega področja metod in tehnik planiranja logističnih procesov,
- poznavanje specialnega področja sistemov sestave,
- povezovanje konceptov planiranja logističnega transportnega sistema v smislu integralnega transporta.

Prenesljive/ključne spretnosti in drugi atributi:

- povezovati uporabo različnih inženirskih znanj za reševanje problemov integralnega transporta pri sistemih sestave,
- študenta izobraziti do nivoja, da se je sposoben soočiti s problemom reševanja novih idej načrtovanja, oblikovanja in optimiranja sistemov sestave.

Intended learning outcomes:**Knowledge and understanding:**

- special knowledge of methods and technics for design of logistics processes,
- special knowledge of all kinds of the assembly systems,
- connection between planning transportation and logistics systems concepts, into the integral transport.

Transferable/Key skills and other attributes:

- combined use of different engineering skills for solution of integral transport in the systems,
- to give students skills, that they can be involved in project work – solving new concepts of planning, design and optimization of the assembly systems.

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:
<p><u>Način (pisni izpit, ustno izpraševanje, naloge, projekt):</u></p> <ul style="list-style-type: none"> opravljene domače in projektna naloga, izpit (teoretično in praktično znanje). Opravljene obveznosti e-predavanj in e-vaj so pogoj za pristop k izpitu. Pisni izpit. Seminarska naloga. Ustni izpit. 	<p>30%</p> <p>20%</p> <p>50%</p>	<p><u>Type (examination, oral, coursework, project):</u></p> <ul style="list-style-type: none"> completed home-works and seminar (project) work, examination (theoretical and practical knowledge). Successful completion of e-lectures and e-tutorials is a prerequisite for entering the exam. Written exam. Seminar work. Oral exam.

Reference nosilca / Lecturer's references:

- REIBENSCHUH, Marko, ODER, Grega, ČUŠ, Franc, POTRČ, Iztok. Modelling and analysis of thermal and stress loads in train disc brakes - braking from 250 km/h to standstill. *Stroj. vestn.*, 2009, vol. 55, no. 7/8, str. 494-502, ilustr. [http://www.sv-jme.eu/scripts/download.php?file=/data/upload/2009/SV-7-8-09/8 Odar zl p494 502.pdf](http://www.sv-jme.eu/scripts/download.php?file=/data/upload/2009/SV-7-8-09/8%20Dar%20zl%20p494%20502.pdf).
- HREN, Gorazd, POTRČ, Iztok, AVSEC, Jurij. Integrated web-based framework for product mechanism simulation. *Advanced engineering*, 2010, year 4, no. 1, str. 25-36, ilustr.
- LERHER, Tone, POTRČ, Iztok, ŠRAML, Matjaž, TOLLAZZI, Tomaž. Travel time models for automated warehouses with aisle transferring storage and retrieval machine. *Eur. J. oper. res.* [Print ed.], Sep. 2010, vol. 205, iss. 3, str. 571-583, doi: [10.1016/j.ejor.2010.01.025](https://doi.org/10.1016/j.ejor.2010.01.025).
- LERHER, Tone, ŠRAML, Matjaž, POTRČ, Iztok, TOLLAZZI, Tomaž. Travel time models for double-deep automated storage and retrieval systems. *Int. J. Prod. Res.*, June 2010, vol. 48, no. 11, str. 3151-3172, doi: [10.1080/00207540902796008](https://doi.org/10.1080/00207540902796008).
- LERHER, Tone, ŠRAML, Matjaž, POTRČ, Iztok. Simulation analysis of mini-load multi-shuttle automated storage and retrieval systems. *Int. j. adv. manuf. technol.*, Published online: 14 September 2010, doi: [10.1007/s00170-010-2916-8](https://doi.org/10.1007/s00170-010-2916-8).
- ŠAMEC, Blaž, POTRČ, Iztok, ŠRAML, Matjaž. Low cycle fatigue of nodular cast iron used for railway brake discs. *Eng fail. anal.* [Print ed.], Available online 18 April 2011., doi: [10.1016/j.engfailanal.2011.04.002](https://doi.org/10.1016/j.engfailanal.2011.04.002).
- KOSTANJŠEK, Grega, GAJŠEK, Brigita. The impact of workplace supply on productivity in functionally organized layouts. *Tehnički glasnik*, ISSN 1848-5588, 2017, vol. 11, no. 1/2, str. 35-44.
- GAJŠEK, Brigita, ŠIMENC, Mitja, LERHER, Tone, POTRČ, Iztok. On the technology roadmapping based development of the new order-picking technology RF kinetic. *Advanced engineering*, ISSN 1846-5900, 2009, year 3, no. 2, str. 167-173