

UČNI NAČRT PREDMETA / COURSE SYLLABUS

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

Študijski program in stopnja Study programme and cycle	Študijska smer Study option	Letnik Year of study	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 (obvezni ali izbirni) /
Course type (compulsory or elective)**

OBVEZNI
COMPULSORY

Univerzitetna koda predmeta / University course code:

VS

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 30 a-P		9 e-V 21 a-V			105	6

**Nosilec predmeta / Course
coordinator:**

IZTOK POTRČ

Jeziki /Languages:

Predavanja / Lectures: SLOVENSKI/SLOVENE

Vaje / Tutorial: SLOVENSKI/SLOVENE

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

Ni pogojev.

**Prerequisites for enrolling in the course or for
performing study obligations:**

No special conditions.

Vsebina (kratek pregled učnega načrta):

Predavanja:

- Uvodna predstavitev vpliva projektnih parametrov na izbiro sistema sestave.
- Metode in tehnike 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 montaže s transportnim in skladiščnim sistemom).

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 systems and influence of manner of transportation and material handling system (Assembly systems without automatically material flow, partly- and completely automatic assembly systems with transportation and warehouse systems).

- Pripomočki za načrtovanje sistema montaže (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/vision...).
- Vmesna skladišča (linijsko vm. skladišče, obtočno vm. skladišče, posebni primeri skladiščenja).
- Varnostne zahteve in primeri montažnih celic.

Seminar:

- Seminar aplikativno dopolnjujejo vsebino predavanj s praktičnim reševanjem problemov določanja montažnih sistemov.

- 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 (barcode, RFID, Pick by light/voice/vision...).
- Buffers (on transportation line buffers, circulation-type buffers, special cases of warehousing).
- Safety demands and cases of assembly cells.

Seminar:

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

Temeljni literatura in viri / Reading materials:

- 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 metod in tehnik načrtovanja montažnih sistemov.
- Določanje ekonomske upravičenosti avtomatizacije montažnega sistema.

Objectives and competences:

- Insight into design methods and techniques. Economic authorization of the automatisaton of assembly systems.

Predvideni študijski rezultati:

Znanje in razumevanje:

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

Prenesljive/ključne spretnosti in drugi atributi:

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:

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

- combined use of different engineering skills for problem solving in planning of logistics processes in assembly 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 %) / Share (in %)	Assessment methods:
<ul style="list-style-type: none"> • Opravljene obveznosti e-predavanj in e-vaj so pogoj za pristop k izpitu. 		<ul style="list-style-type: none"> • Successful completion of e-lectures and e-tutorials is a prerequisite for entering the exam.
<ul style="list-style-type: none"> • Pisni izpit. 	50%	<ul style="list-style-type: none"> • Written examination.
<ul style="list-style-type: none"> • Seminarska naloga 	40%	<ul style="list-style-type: none"> • Seminar work.
<ul style="list-style-type: none"> • Predstavitev seminarske naloge. 	10%	<ul style="list-style-type: none"> • Oral presentation of seminar work.

Reference nosilca / Course coordinator's references:

1. 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.
2. 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.
3. 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).
4. 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).
5. 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).

6. 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).
7. 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.
8. 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.