

**UČNI NAČRT PREDMETA / COURSE SYLLABUS**

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| <b>Ime predmeta:</b> | TEORIJA SISTEMOV  |
| <b>Course title:</b> | THEORY OF SYSTEMS |

| <b>Študijski program in stopnja</b><br>Study programme and cycle | <b>Študijska smer</b><br>Study option | <b>Letnik</b><br>Year of study | <b>Semester</b><br>Semester |
|--|---------------------------------------|--------------------------------|-----------------------------|
| LOGISTIKA SISTEMOV 1. stopnja                                    |                                       | 1.                             | 1.                          |
| SYSTEM LOGISTICS 1 <sup>st</sup> degree                          |                                       | 1.                             | 1.                          |

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| <b>Vrsta predmeta (obvezni ali izbirni) /</b><br>Course type (compulsory or elective) | OBVEZNI    |
|   | COMPULSORY |

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| <b>Univerzitetna koda predmeta / University course code:</b> | UN |
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| <b>Predavanja</b><br>Lectures | <b>Seminar</b><br>Seminar | <b>Vaje</b><br>Tutorial | <b>Klinične vaje</b><br>Clinical training | <b>Druge oblike študija</b><br>Other forms of study | <b>Samost. delo</b><br>Individual work | <b>ECTS</b> |
|-------------------------------|---------------------------|-------------------------|---|---|--|-------------|
| 30 a-P<br>30 e-P              |                           | 15 e-V<br>15 a-V        |   |   | 120                                    | 7           |

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| <b>Nosilec predmeta / Course coordinator:</b> | BOJAN ROSI |
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| <b>Jeziki /Languages:</b> | <b>Predavanja / Lectures:</b> SLOVENSKI/SLOVENE |
|                           | <b>Vaje / Tutorial:</b> SLOVENSKI/SLOVENE       |

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

| <b>Vsebina (kratek pregled učnega načrta):</b>   | <b>Content (syllabus outline):</b>  |
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| <ul style="list-style-type: none"> <li>▪ Uvod v teorijo sistemov.</li> <li>▪ Razvoj teorije sistemov.</li> <li>▪ Splošne karakteristike sistemov.</li> <li>▪ Principi sistemov: lastnosti sistemov, struktura in delovanje sistemov, stanje sistema, sistemski procesi.</li> <li>▪ Dinamični sistemi: linearni dinamični sistemi, bločna algebra, dinamika obnašanja linearnih sistemov, zvezni sistemi, diskretni sistemi.</li> <li>▪ Modeliranje in simulacije sistemov.</li> <li>▪ Variante teorije sistemov: FUZZY, teorija živih sistemov, metodologija mehkih sistemov, teorija viabilnih sistemov, kritično sistemsko razmišljanje, dialektična teorija sistemov.</li> <li>▪ Teorija omrežnega razmišljanja.</li> <li>▪ Sistemsko metodologija dialektično-omrežnega razmišljanja.</li> </ul> | <ul style="list-style-type: none"> <li>▪ Introduction to the theory of systems.</li> <li>▪ Development of the theory of systems.</li> <li>▪ General characteristics of systems.</li> <li>▪ Principles of systems: characteristics of systems, structure and functioning of systems, the state of a system, system processes.</li> <li>▪ Dynamic systems: linear dynamic systems, block algebra, the dynamics of the performance of linear systems, continuous systems, discrete systems.</li> <li>▪ Modelling and simulations of systems.</li> <li>▪ Variant theories of systems: fuzzy, theory of living systems, soft systems methodology, theory of variable systems, critical systemic thinking, dialectic theory of systems.</li> <li>▪ Theory of network thinking.</li> </ul> |

- System methodology of dialectical networked thinking.

### Temeljni literatura in viri / Reading materials:

E-gradivo predmeta.  
 Rosi, B. Osnove teorije sistemov e-gradivo. 2008, FL.  
 Kljajič, M. Teorija sistemov, FOV, 2008.  
 Rosi, B. Ali ste pripravljeni dialektično omrežno razmišljati? 2008, Maribor, RoBo.  
 Mulej, M. Dialektična in druge mehkosistemske teorije, Maribor, EPF, 2000.  
 Rosi, B. Teorija sistemov v praksi, Celje, FL, 2006.  
 Bertalanffy, v. L. General Systems Theory, Foundations, Development, Applications, Revised Edition. Sixth Printing, New York, Brazillier. 1979.  
 Checkland, P. Systems Thinking, Systems Practice, Wiley, Chichester, Velika Britanija. 1981.

### Cilji in kompetence:

Študenti pri tem predmetu:  
 osvojijo osnove pojmov iz teorije sistemov, spoznajo uporabnost različnih teorij sistemov, se naučijo systemskega razmišljanja in uporabe systemskega pristopa pri razreševanju problemov, tj. uporabe teoretičnih osnov na aplikativnih primerih, spoznajo logistiko kot primer sistema s številnimi podsistemi, spoznajo odnose in soodvisnosti med njimi.

### Objectives and competences:

In this course students:  
 get the basic grasp of theory of systems, are familiarised with the applicability of different theories of systems, learn to think systematically and to use system approach in problem solving, i.e. the use of theoretical basis for application examples, they are familiarised with logistics as an example of a system with numerous subsystems, they are familiarised with relations and interdependence between them.

### Predvideni študijski rezultati:

Znanje in razumevanje:

- študenti osvojijo osnovne pojme teorije sistemov,
- študenti se naučijo uporabljati systemski pristop pri reševanju kompleksnih problemov,
- študenti razlikujejo temeljne značilnosti posameznih teorij sistemov,
- študenti se naučijo uporabljati systemsko metodologijo.

### Intended learning outcomes:

Knowledge and understanding:

- students understand basic concepts of the theory of systems,
- students learn to use system approach in solving complex problems,
- students recognize basic characteristics of separate theories of systems,
- students learn to apply system methodology.

### 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

### 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-

pripravljenih e-gradiv v virtualnem elektronskem učnem okolju).

conferencing or with the help of specially designed e-material in a virtual electronic learning environment).

| <b>Načini ocenjevanja:</b>   | Delež (v %) /<br>Share (in %)  | <b>Assessment methods:</b>   |
|--|--|--|
| <ul style="list-style-type: none"><li>▪ Opravljene obveznosti e-predavanj in e-vaj so pogoj za pristop k izpitu.</li><li>▪ Pisni izpit.</li><li>▪ Vaje.</li><li>▪ Zagovor seminarske naloge.</li></ul> | <p style="text-align: center;">70%</p> <p style="text-align: center;">10%</p> <p style="text-align: center;">20%</p> | <ul style="list-style-type: none"><li>▪ Successful completion of e-lectures and e-tutorials is a prerequisite for entering the exam.</li><li>▪ Written exam.</li><li>▪ Tutorials.</li><li>▪ Defence of project work.</li></ul> |

**Reference nosilca / Course coordinator's references:**

1. ROSI, Bojan, MULEJ, Matjaž. Diminishing traffic negative impacts over natural environment by a requisitely holistic approach to logistics. *Logistics and sustainable transport*, 22-05-07, vol. 1, iss. 1, 13 str. [http://www.jlst.sla.si/uploads/transportokolje\\_rosimulej.pdf](http://www.jlst.sla.si/uploads/transportokolje_rosimulej.pdf).
2. LISEC, Andrej, ROSI, Bojan, KAVRAN, Zvonko. Holistic thinking aproach : case study of post network in Slovenia. *Promet (Zagreb)*, 2008, vol. 20, no. 2, str. 79-86.
3. ROSI, Bojan, KRAMBERGER, Tomaž. *Ali ste pripravljeni dialektično omrežno razmišljati?*. Maribor: RoBo, 2008. 296 str., ilustr., tabele. ISBN 978-961-92334-0-5.
4. ROSI, Bojan. Development of transport infrastructure in Slovenia. V: SCHENK, Winfried (ur.), SCHENK, Tilman A. (ur.). *Forschung im Spannungsfeld zwischen Geographie und Ökonomie : zum 65. Geburtstag von Konrad Schliephake*, (Würzburger Geographische Manuskripte, Heft 75). Würzburg: Institut für Geographie der Universität, cop. 2009, str. 54-60.
5. KNEZ, Matjaž, ROSI, Bojan, MULEJ, Matjaž, LIPIČNIK, Martin. Competitiveness by requisitely holistic and innovative logistic management. *Promet (Zagreb)*, 2010, vol. 22, no. 3, str. 229-237.