

## UČNI NAČRT PREDMETA / COURSE SYLLABUS

**Ime predmeta:** OSNOVE TEORIJE SISTEMOV  
**Course title:** FUNDAMENTALS OF THE THEORY OF SYSTEMS

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

**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
24 e-P 36 a-P		9 e-V 21 a-V			90	6

**Nosilec predmeta / Course  
coordinator:**

BOJAN ROSI

**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:**

None.

**Vsebina (kratek pregled učnega načrta):**

- Izhodišča teorije sistemov.
- Razvoj teorije sistemov.
- Osnovne karakteristike sistemov.
- Lastnosti sistemov, struktura in delovanje sistemov ter stanje sistema.
- Sistemski procesi.
- Osnove modeliranja in simulacije sistemov.
- Osnove FUZZY teorije.
- Osnove teorije živih sistemov.
- Metodologija mehkih sistemov.

**Content (syllabus outline):**

- Introduction to the theory of systems.
- Development of the theory of systems.
- Basic characteristics of systems.
- Characteristics of systems, structure and functioning of systems and the state of a system.
- System processes.
- Basic of modelling and simulations of systems.
- Basic of fuzzy theory.
- Basic of theory of living systems.
- Soft systems methodology.

**Temeljni literatura in viri / Reading materials:**

Rosi, B., & Sternad, M. (2010). *Teorija sistemov*. E-gradivo. Celje: Fakulteta za logistiko, Univerza v Mariboru.  
Rosi, B. (2008). *Teorija sistemov v praksi*. Celje: Fakulteta za logistiko, Univerza v Mariboru..  
Bertalanffy, v. L. (1979). *General Systems Theory, Foundations, Development, Applications, Revised Edition*. Sixth Printing, New York, Brazillier.  
Checkland, P. (1981). *Systems Thinking, Systems Practice*. Wiley, Chichester, Velika Britanija.

**Cilji in kompetence:**

Cilji predmeta so:

- razumevanje osnovnih pojmov iz teorije sistemov,
- razumevanje temeljnih variant teorij sistemov
- razumevanje ustrezne uporabe systemskega razmišljanja in systemskega pristopa pri razreševanju (logističnih) problemov

Kompetence:

- študent je zmožen prepoznati in uporabiti ustrezne osnovne pojme teorije sistemov
- študent je zmožen uporabiti systemsko razmišljanje in systemski pristop pri razreševanju (logističnih) problemov
- študent je sposoben prepoznati vlogo posameznih sestavin (logističnega) sistema in jih primerno umestiti ter povezati v zaokroženo, dovolj celovito celoto
- študent se nauči praktične uporabnosti sisitemskih pristopov v vsakodnevni praksi

**Objectives and competences:**

The objectives of the course are:

- understanding of basic concepts from systems theory,
- understanding the basic variants of systems theories
- understanding the appropriate use of systems thinking and a systems approach to problem-solving (in logistics)

Competences:

- the student can recognize and use the relevant basic concepts of systems theory
- the student can use systems thinking and a systems approach to solving (logistic) problems.
- the student can recognize the role of individual components of the (logistics) system and place them appropriately and connect them into a rounded, sufficiently complete whole
- the student will learn the practical applicability of systemic approaches in everyday practice

**Predvideni študijski rezultati:**

Po uspešno zaključenem predmetu so študenti zmožni:

- opisati osnovne gradnike (sestavine in povezave) teorije sistemov,
- uporabiti systemski pristop pri reševanju (logističnih) problemov,
- razlikovati temeljne značilnosti posameznih teorij sistemov,
- uporabiti systemsko metodologijo v praksi.

**Intended learning outcomes:**

Upon successful completion of this course, students can:

- describe the basic building blocks (components and connections) of systems theory,
- use a systematic approach to (logistic) problem-solving,
- distinguish the essential characteristics of individual systems theories,
- use a system methodology in practice.

**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).

**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).

**Vaje:**  
 pri vajah študent utrdi teoretično znanje in spozna aplikativne možnosti. Praktične strokovne ekskurzije v podjetja v RS. 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).

**Tutorials:**  
 Students enhance their theoretical knowledge and learn how to apply it. Part of the seminar is in a classroom, while the rest is in the form of e-tutorial (e-seminars may be given via video-conferencing or with the help of specially designed e-material in a virtual electronic learning environment).

<b>Načini ocenjevanja:</b>	<b>Delež (v %) / Share (in %)</b>	<b>Assessment methods:</b>
Opravljenosti obveznosti (e-predavanja, e-vaje in predstavitve seminarske/projektne naloga) so pogoj za pristop k izpitu.		Successful completion of e-lectures, e-tutorials and presentation of a seminar/project work at tutorials is a prerequisite for entering the exam.
- Pisni izpit	70 %	- Written examination
- E-vaje in E-predavanja	10 %	- E-lectures and E-tutorials
- Predstavitev seminarske/projektne naloge v okviru vaj	20 %	- Presentation of a seminar/project work at tutorials

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

- HRIBAR, Gašper, PODBREGAR, Iztok, ROSI, Bojan. A model of citizens' trust in intelligence services. *Security journal*, ISSN 1743-4645.
- DRAGAN, Dejan, KESHAVARZSALEH, Abolfazl, POPOVIĆ, Vlado, JEREB, Borut, ROSI, Bojan. Model-based condition monitoring : state-space solution for counter-current heat exchanger. *Journal of engineering thermophysics*, ISSN 1990-5432, 2020, vol. 2, iss. 1, str. 503-517, ilustr.
- BUTTON, Kenneth John, KRAMBERGER, Tomaž, GROBIN, Klemen, ROSI, Bojan. A note on the effects of the number of low-cost airlines on small tourist airports' efficiencies. *Journal of Air Transport Management*, ISSN 1873-2089.
- STERNAD, Marjan, JAGRIČ, Timotej, ROSI, Bojan. Railway usage charges based on marginal maintenance costs. *Proceedings of the Institution of Civil Engineers - Transport*, ISSN 1751-7710. 3
- GUMZEJ, Roman, ROSI, Bojan. Automated authentication and authorisation of consignors and their consignments within secure supply chains : Elektronski vir. *Tehnički vjesnik*, ISSN 1848-6339, 2018, vol. 25, iss. 1, str. 203-209.
- GUMZEJ, Roman, ROSI, Bojan. An agent-based simulation of a QoS-oriented supply chain. *Promet*, ISSN 0353-5320. [Print ed.], 2017, vol. 29, no. 6, str. 593-601, ilustr.