UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	**Telekomunikacijska infrastruktura**
Course title:	*Telecommunication Infrastructure*

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Pravo in management infrastrukture in nepremičnin – 1. stopnja		2	2
Law and Management of Infrastructure and Real Estate – 1st. degree		2	2

Vrsta predmeta / Course type   Obvezni/compulsory

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
35	0	30	0	0	85	6

Nosilec predmeta / Lecturer: izr. prof. dr. Bojan Cestnik

Jeziki / **Languages:**	**Predavanja /** **Lectures:**	Slovenski jezik/Slovenian
	Vaje / Tutorial:	Slovenski jezik/Slovenian

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Osnovno poznavanje računalništva in informatike. Vsaj 80% prisotnost na predavanjih in vajah.	Basic knowledge in computer and information science. At least 80% attendance at lectures and tutorials.

Vsebina:	Content (Syllabus outline):

1. Uvod v področje telekomunikacijskih in informacijskih tehnologij (IKT) in sistemov
   − Cilji in namen predmeta
   − Predstavitev učnih pripomočkov in načina dela
	1. Introduction to telecommunication and information technologies (ICT) and systems
	   − The goal and purpose of the course
	   − Explanation of course materials

- Predstavitev obveznosti študentov
- Napotki za študij
- Informatizacija poslovanja
- IKT kot konkurenčna prednost
- Vrste informacijskih sistemov
- Uporaba metafor za razumevanje informatike

2. Telekomunikacijska in računalniška omrežja
   - Struktura in arhitektura omrežij
   - Zvok in podatki v komunikaciji
   - Paketni prenosi in protokoli
   - Nove generacije UMTS in 4G
   - Računanje v oblaku

3. Načrtovanje in razvoj informacijsko komunikacijskih sistemov
   - Dimenzije razvoja aplikacij
   - Strategija hitrega razvoja
   - Življenjski cikel razvoja IS
   - Metodologije in faze razvoja informacijskih sistemov
   - Obvladovanje tveganj
   - Varnost informacijskih sistemov
   - Modeliranje v jeziku UML
   - UML diagrami primerov uporabe

4. Geografski informacijski sistemi
   - Sestava GIS
   - Modeliranje in tehnologija
   - Kje smo že srečali GIS
   - Analize s pomočjo GIS
   - GIS v aplikaciji

5. Računalniška in informacijska varnost
   - Varovanje informacij
   - Računalniška varnost
   - Upravljanje s tveganji
   - Varnostne politike

and method of work
- Student requirements
- Study guide
- Business informatization
- ICT as competitive advantage
- Kinds of information systems
- Metaphors for understanding of informatics

2. Telecommunication and computer networks
   - Structure and architecture of networks
   - Voice and data communications
   - Package transfer and protocols
   - Local wireless technologies
   - Cloud computing

3. Design and development of information and communication systems
   - Application development dimensions
   - Rapid application development
   - IS life cycle
   - Methodologies and phases of IS development
   - Risk management
   - Information systems' security
   - Modeling with UML
   - UML use case diagrams

4. Geographic information systems
   - GIS components
   - Modeling and technology
   - Where have we met GIS
   - GIS analyses
   - GIS in application

5. Computer and information security
   - Protection of information
   - Computer security
   - Risk management
   - Information security policies

Temeljna literatura in viri / Study Literature:

OBVEZNA:

1. Khader, M., Barnes W. E., Telecommunication Systems and Technology, Prentice Hall, New Jersey, 2000.
2. Whitten, J.L., Bentley, L.D.: System analysis and design methods, Irwin/McGraw-Hill, 2005.
3. McConnell, S.: Code Complete, A Practical Handbook of Software Construction, Microsoft Press, 2004

PRIPOROČENA:

1. McConnell, S.: Rapid development, Taming Wild Software Schedules, Microsoft Press, 1996.
2. Kroll, P., Kruchten, P.: The Rational Unified Process Made Easy: A Practitioner's Guide to Rational Unified Process, Addison Wesley, 2003.
3. Linthicum, D.S.: Next Generation Application Integration: From Simple Information to Web Services, Addison Wesley, Boston 2004
4. Booch , G., Jacobson, I., Rumbaugh. J., The Unified Modeling Language User Guide, Addison Wesley, 1998.

Cilji in kompetence:

Študenti/ke bodo pridobili naslednje predmetno specifične kompetence:

- poznavanje temeljnih konceptov telekomunikacij, mrežnih tehnologij ter računalniško informacijskih tehnologij
- razumevanje zgradbe in delovanja računalnika ter računalniških omrežij
- sposobnost uporabe orodij za analizo in načrtovanje IKT sistemov

Študenti/ke bodo pridobili naslednje splošne kompetence:
- sposobnost učinkovite uporabe IKT sistemov

Objectives and competences:

Students will gain the following subjects specific competences:

- understanding of the basic concepts in telecommunications, networking and computer and information technologies
- understanding of the structure and functionality of computer and networking systems
- ability to use tools for ICT systems analysis and design

Students will gain the following general competences:
- ability to use ICT systems efficiently

Predvideni študijski rezultati:

Intended learning outcomes:

Znanje in razumevanje:	Knowledge and understanding:
− Poglobljeno znanje temeljnih IKT konceptov − Poznavanje zgradbe in delovanja računalnika in računalniških omrežij − Poznavanje osnovnih konceptov analize in načrtovanja IKT sistemov − Poznavanje področja informacijske varnosti	− Acquired knowledge about basic ICT concepts − Familiarity with the structure and functionality of computers and computer networks − Familiarity with the basic concepts of ICT systems analysis and design − Familiarity with the field of information security

Metode poučevanja in učenja: / **Learning and teaching methods:**

− Predavanja z aktivno udeležbo študentov (razlaga, diskusija, vprašanja in odgovori, primeri reševanja problemov) − Individualno in skupinsko raziskovalno, projektni in seminarsko delo − Individualne in skupinske konzultacije (diskusija, dodatna razlaga, obravnava specifičnih vprašanj) − Sodelovanje na daljavo z uporabo informacijsko komunikacijske tehnologije	− Lectures with active students' involvement (explanation, discussion, questions and answers, case studies) − Individual and group research and project work, seminar assignments − Individual and group consultations (discussion, additional explanation, handling specific questions) − Remote collaboration by using modern ICT tools

Oblike dela:
- ☒ Frontalna oblika poučevanja
- ☒ Delo v manjših skupinah oz. v dvojicah
- ☒ Samostojno delo študentov
- ☒ e-učenje
- ☐ drugo (vpišite) _____

Metode (načini) dela:
- ☒ Razlaga
- ☒ Razgovor/ diskusija/debata
- ☐ Delo z besedilom
- ☒ Proučevanje primera
- ☒ Igra vlog
- ☐ Druge vrste nastopov študentov
- ☒ Reševanje nalog
- ☐ Študijski obiski podjetij ipd.)
- ☐ Vključevanje gostov iz prakse
- ☐ Udeležba na okrogli mizi, na konferenci

Types of learning/teaching:
- ☒ Frontal teaching
- ☒ Work in smaller groups or pair work
- ☒ Independent students work
- ☒ e-learning
- ☐ other _____

Teaching methods:
- ☒ Explanation
- ☒ Conversation/discussion/debate
- ☐ Work with texts
- ☒ Case studies
- ☒ Role-play
- ☐ Different presentation
- ☒ Solving exercises
- ☐ Field work (e.g. company visits)
- ☐ Inviting guests from companies
- ☐ Attending round table and conference

Delež (v %) /

Načini ocenjevanja:	Weight (in %)	Assessment:
Način (pisni izpit, ustno izpraševanje, naloge, projekt): pisni izpit (80%), sodelovanje (20%).		Type (examination, oral, coursework, project): written examination (80%), collaboration (20%).

Reference nosilca / Lecturer's references:

Prof. dr. **Bojan Cestnik** je direktor podjetja za računalniški inženiring Temida in raziskovalec na odseku za Tehnologije znanja na Institutu Jožefa Stefana v Ljubljani. Iz računalniških znanosti je doktoriral leta 1991 na Fakulteti za računalništvo Univerze v Ljubljani. Strokovno se ukvarja s področji informacijskih sistemov, ki temeljijo na znanju, modeliranjem poslovnih sistemov, sistemi za podporo odločanju, in računalniško podprtim učenjem. Rezultate svojega raziskovalnega dela predstavlja v revijah in na mednarodnih konferencah. Ima izkušnje z vodenem razvoja in vzdrževanja mnogih velikih projektov programske opreme za podporo poslovanja.

Prof. dr. **Bojan Cestnik** is the managing director of Temida software company and a researcher in the department of Knowledge technologies at Jozef Stefan Institute in Ljubljana. He obtained his Ph.D. in Computer Science in 1991 at the Faculty of Electrical Engineering and Computer Science, University of Ljubljana, Slovenia. His professional and research interests include knowledge based information systems, business process modeling, decision support systems and machine learning. His research work was presented in scientific jounals and at several international conferences. He has been responsible for several large-scale software development and maintenance projects for supporting business operations.

Izbrane objave / Selected bibliography

CESTNIK, Bojan, BOHANEC, Marko, URBANČIČ, Tanja. QTvity: Advancing Students' Engagement during Lectures by Using Mobile Devices. International conference on Computer Systems and Technologies CompSysTech'15. June 25-26, 2015, Dublin City University, Ireland.

CESTNIK, Bojan, KERN, Alenka, MODRIJAN, Helena. Semi-automatic ontology construction for improving comprehension of legal documents. Lect. notes comput. sci., 2008, lNCS 5184, str. 328-339. [COBISS.SI-ID 23096103]

CESTNIK, Bojan, PETRIČ, Ingrid, URBANČIČ, Tanja, MACEDONI-LUKŠIČ, Marta. Structuring domain knowledge by semi-automatic ontology construction. Organizacija (Kranj), 2007, letn. 40, št. 6, str. 233-238. [COBISS.SI-ID 824571]

PUR, Aleksander, BOHANEC, Marko, LAVRAČ, Nada, CESTNIK, Bojan. Primary health-care network monitoring : a hierarchical resource allocation modeling approach. Int. j. health plann. manage., 2010, vol. 25, no. 2, str. 119-135. [COBISS.SI-ID 23721255]

PETRIČ, Ingrid, CESTNIK, Bojan, LAVRAČ, Nada, URBANČIČ, Tanja. Outlier detection in cross-context link discovery for creative literature mining. Comput. j., 2012, vol. 55, no. 1, str. 47-61, doi: 10.1093/comjnl/bxq074. [COBISS.SI-ID 1621243]

MACEDONI-LUKŠIČ, Marta, PETRIČ, Ingrid, CESTNIK, Bojan, URBANČIČ, Tanja. Developing a deeper understanding of autism : connecting knowledge through literature mining. autism res. treat., 2011, vol. 2011, 8 str. [COBISS.SI-ID 1916411]

PETRIČ, Ingrid, URBANČIČ, Tanja, CESTNIK, Bojan, MACEDONI-LUKŠIČ, Marta. Literature mining method RaJoLink for uncovering relations between biomedical concepts. Journal of biomedical informatics, apr. 2009, vol. 42, no. 2, str. 219-227. [COBISS.SI-ID 929787]

LAVRAČ, Nada, CESTNIK, Bojan, GAMBERGER, Dragan, FLACH, Peter A. Decision support through subgroup discovery : three case studies and the lessons learned. Mach. learn.. [Print ed.], 2004, vol. 57, str. 115-143. [COBISS.SI-ID 18515239]