UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Internetna omrežja in tehnologije
Course title:	Internet networks and technologies

Študijski program in stopnja Study programme and level	Modul Module	Letnik Academic year	Semester Semester
Informacijske in komunikacijske tehnologije, 2. stopnja	Napredne internetne tehnologije	1	1
Information and Communication Technologies, 2nd cycle	Advanced Internet Technologies	1	1

Vrsta predmeta / Course type Izbirni / Elective

Univerzitetna koda predmeta / University course code: IKT2-655

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Druge oblike	Samost. delo Individ. work	ECTS
60	**30**			**60**	**450**	**20**

**Navedena porazdelitev ur velja, če je vpisanih vsaj 15 študentov. Drugače se obseg izvedbe kontaktnih ur sorazmerno zmanjša in prenese v samostojno delo. / This distribution of hours is valid if at least 15 students are enrolled. Otherwise the contact hours are linearly reduced and transfered to individual work.*

Nosilec predmeta / Lecturer: Prof. dr. Borka Jerman Blažič
Doc. dr. Tomaž Klobučar

Jeziki / Languages:	
Predavanja / Lectures:	slovenščina, angleščina / Slovenian, English
Vaje / Tutorial:	slovenščina, angleščina / Slovenian, English

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

Zaključen študijski program prve stopnje s področja naravoslovja, tehnike ali računalništva.

Prerequisites:

Student must complete first-cycle study programmes in natural sciences, technical disciplines or computer science.

Vsebina:

I. del
- Temelji pojmi o informacijski infrastrukturi
- Osnovne tehnike povezovanja in delovanja informacijske infrastrukture
- Gradniki omrežij, naprave in sistemi
- Struktura in lastnosti komunikacijskih protokolov: povezavni in nepovezavni protokoli, povezava med protokoli in storitvami
- Referenčni modeli in arhitekture: primerjava ISO/OSI in TCP/IP
- Sodobna telekomunikacijska omrežja (mobilna, brezžična, omrežja tretje generacije)
- Hrbtenična in dostopovna omrežja

II. del
- Internet in protokoli skladovnice TCP/IP

Content (Syllabus outline):

Part I.
- Basic terms and notions
- Transmission techniques and communication infrastructure interworking.
- Network elements, devices and systems
- Structure and properties of communication protocols: connection-oriented and connectionless protocols, connection between protocols and services
- Reference models and architectures: comparison ISO/OSI and TCP/IP
- Networks and technologies: mobile, wireless, 3G networks.
- Backbone and access networks

Ethernet in ostali protokoli podatkovne linije IP protokol in ostali protokoli omrežnega sloja IP TCP protokol in ostali protokoli transportnega sloja TCP IPv6 Arhitektura, naslavljanje, sistem imenskega prostora, preslikave naslovov Protokoli za usmerjanje prometa, avtonomni sistemi III. del Protokoli aplikacijskega dela: imenski prostor interneta, prenos datotek, svetovni splet, elektronska pošta, prenos video podatkov, P2P komunikacija Senzorska omrežja Internet stvari IV. del Administracija in vodenje/upravljanje interneta, intelektualna lastnina interneta, internacionalizacija storitev, ustanove Interneta (ICANN, ISOC, IETF) in druge (WSIS, OECD, ITU) Družabna omrežja (WEB 2.0), nove vsebine, mobilni internet, uporabniško orientiran internet (W3C)	Part II. TCP/IP protocol stack Ethernet and other link layer protocols IP layer protocols TCP layer protocols IPv6 Internetworking with TCP/IP Architecture, addressing, DNS, naming and mapping Routing protocols, autonomous systems Part III. Application layer protocols and services: DNS, FTP, WWW, SMTP, VoI, P2P communication (P2PTV), sensor networks, Internet of Things Part IV. Internet governance. Administration and management of the Internet (ICANN, ISOC, IETF) and other institutions (WSIS, OECD, ITU), Internet intellectual property, service internationalisation and other Internet associations (W3C). Social networks, new content provision, user centric Internet

Temeljna literatura in viri / Readings:

Izbrana poglavja iz naslednjih knjig: / Selected chapters from the following books:

- B. A. Forouzan, *Data Communications and Networking*, McGraw Hill, 4th edition, 2007, N.Y. ISBN 978-0-07-296775-3
- A. S.Tanenbaum, *Computer Networks*, 4th, edition, Prentice Hall, 2007, N.J. ISBN 978-0-132-12695-3
- P. Loshin, IPv6 Clearly explained, Academic Press, S.F, 1999 ISBN: 978-1-558-60810-8
- J. F. Kurose, K. W. Ross, *Computer Networking*, 6th edition, Addison-Wesley, 2014, New York. ISBN 0136079679

Cilji in kompetence:	**Objectives and competences:**
V zadnjem obdobju se je pomembnost informacijsko komunikacijskih sistemov izjemno povečala. Uporaba teh sistemov je privedla do njihove prepletenosti, ki jo danes razumemo kot najbolj pomembno informacijsko infrastrukturo. Temeljna tehnologija pri zagotavljanju te komunikacijske infrastrukture na raven omrežja je skladovnica protokolov TCP/IP. Osnovni cilj tega predmeta je posredovanje teoretičnega in praktičnega znanja o temeljih internetnih omrežij in internetnih tehnologij prenosa podatkov.	In the last years the importance of information and communication systems has greatly increased. The increased utilization and reliance upon information systems in economy, various sectors, from private to government, and everyday life, has led to inextricable linking of the systems that are today considered as a most important information infrastructure. The primary goal of this course is to provide the students theoretical and practical knowledge with the area of Internet, TCP/IP protocol stack and related communication technologies.

Splošne kompetence:	General Competences:
• Sposobnost analize, sinteze in razumevanja • Sposobnost uporabe znanja v praksi • Avtonomnost v strokovnem delu • Razvoj komunikacijskih sposobnosti in spretnosti, posebej komunikacije v mednarodnem okolju • Etična refleksija in zavezanost profesionalni etiki • Kooperativnost, delo v skupini (in v mednarodnem okolju)	• An ability to analyse, synthesise and anticipate solutions and consequences • An ability to apply the theory in to a practice • An autonomy in the professional work • Communicational-skills development; particularly in international environment • Ethical reflection and obligation to a professional ethics • Cooperativity, team work (in international environment)
Predmetnospecifične kompetence: • Razumeti in ovrednotiti delovanje internetnih omrežij • Poznati delovanje TCP/IP protokolov • Izbrati ter uporabiti pristope in metodologije za obravnavo in upravljanje sistemov, ki slonijo na internetni skladovnici protokolov in s tem povezanim raziskovalnim delom • Nadaljevati raziskovalno-razvojno delo na področju digitalnega prenosa in internetne tehnologije	Subject specific competences: • Understand and evaluate the functioning of the Internet networks • Understand the functioning of the world mesh networks connected with TCP/IP protocols • Select and use approaches and methodologies for addressing the needs in interconnecting networks and related l information infrastructure • Continue research and development work in the area of digital networks

Predvideni študijski rezultati:	**Intended learning outcomes**
• Obvladovati temeljna znanja na področju internetnih omrežij • Obvladovati učinkovito uporabo internetnih storitev	• Acquiring the basic knowledge about internet networks, the architecture and the TCP/IP protocol stack • Effective use of the Internet services

Metode poučevanja in učenja:	**Learning and teaching methods:**
predavanja, seminarji, laboratorijsko delo	Lectures, seminar work, laboratory work

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Seminarska naloga	50 %	Seminar work
Ustni zagovor seminarske naloge	50 %	Oral defense of seminar work

Reference nosilca / Lecturer's references:

- C. Callanan, **B. Jerman-Blažič**, A. Jerman Blažič. User tolerance of privacy abuse on mobile Internet and the country level of development. *Information development*, ISSN 0266-6669, [in press], 10 p., 2015.
- C. Callanan, **B. Jerman-Blažič**. User understanding of privacy in emerging mobile markets. *IEEE technology & society magazine*, ISSN 0278-0097, vol. 33, no. 4, pp. 48-56, 2014.
- R. Bojanc, **B. Jerman-Blažič**. A quantitative model for information-security risk management. *Engineering management journal*, vol. 25, no. 3, pp. 25-37, 2013.
- R. Bojanc, **B. Jerman-Blažič**. Quantitative model for economic analyses of information security investment in an enterprise information system. *Organizacija*, vol. 45, no. 6, pp. 276-288, 2012.
- R. Bojanc**, B. Jerman-Blažič**, M. Tekavčič, *Informacijska varnost v podjetniškem okolju: potrebe, ukrepi in ekonomika vlaganj*, Ekonomska fakulteta, VI, 168 p. 2014.