

	UČNI NAČRT PREDMETA/COURSE SYLLABUS
Predmet	Omrežno računalništvo
Course title	Web Computing

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Poslovna informatika / 1. stopnja	Poslovna informatika	2.	4.
Business Informatics / 1 st Cycle	Business Informatics	2 nd	4 th

Vrsta predmeta/Course type

obvezni/obligatory

Univerzitetna koda predmeta/University course code

I_PI_2_UN9

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
30			30		40	4

Nosilec predmeta/Lecturer:

dr. Borut Čampelj, pred.

Jeziki/ Languages:

Predavanja/Lectures: slovenski/Slovenian

Vaje/Tutorial: slovenski/Slovenian

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

Prerequisites:

- Pogoj za vključitev v delo je vpis v drugi letnik študija.
- Študent mora pred izpitom pripraviti in predstaviti seminarsko nalogo.

- The prerequisite for participation is enrolment in the second year of study.
- Students have to successfully prepare and present a seminar paper before the examination.

Vsebina:

Content (Syllabus outline):

- Pregled razvoja komunikacijskih sistemov (razvoj telefonskih in računalniških omrežij, konvergenca, integriran sistem in integrirane storitve).
- Vsebina in pomen informacijsko-komunikacijskega sistema. Povezovanje uporabnikov, povezovanje računalnikov. Tesne in ohlapne

- Review of the communication systems development (development of telephone and computer networks, convergence, integrated system and integrated services).
- Content and importance of information and communication system. Connecting users, connecting computers. Close

<p>povezave. Omrežne povezave.</p> <ul style="list-style-type: none"> • <i>Struktura in arhitektura sistema.</i> Definicija komunikacijske plasti. Entitetni par. Standardizacija plasti in modeli večplastnih sistemov (model TCP/IP, referenčni model ISO OSI, primerjava obeh). • <i>Komunikacijski protokoli.</i> Definicija protokola. Specifikacija. Mehanizmi potrjevanja in kontrola pretoka. • <i>Informacijske storitve:</i> standardne uporabniške storitve (oddaljen dostop, prenos datotek, elektronska pošta, splet ...), podporne storitve predstavljene in sejne plasti. • <i>Varnost, zanesljivost in zaščita.</i> Kriptografija, pregled in uporaba simetričnih in asimetričnih kriptografskih mehanizmov. Zgoščevalne funkcije, elektronski podpis. • <i>Transport sporočil</i> (transportni sistem, komplementarnost transportne in omrežne plasti) • <i>Usmerjevalni postopki</i> (klasifikacija usmerjevalnih algoritmov, usmerjanje v internetu). • <i>Tipi preklapljanja, tipi prenosnih sistemov, protokoli skupinskih prenosnih medijev.</i> • <i>Prenosni mediji</i> (žične, optične in brezžične povezave). 	<p>and loose connections. Network connections.</p> <ul style="list-style-type: none"> • <i>Structure and system architecture.</i> Definition of communication layers. Entity pair. Standardisation of layers and models of multi-layered systems (TCP/IP model, ISO OSI reference model, comparison of both models). • <i>Communication protocols.</i> Definition of protocol. Specification. Mechanisms of confirmation and control of flow. • <i>Information services:</i> standard user services (remote access, transfer of files, electronic mail, the Internet, etc.), support services of presentation and session layers. • <i>Security, reliability and protection.</i> Cryptography, review and use of symmetric and asymmetric cryptographic mechanisms. Hash functions, electronic signature. • <i>Transport of messages</i> (transport system, complementariness of transport and network layers). • <i>Routing procedures</i> (classification of routing algorithms, routing to the Internet). • <i>Types of switching, types of transmission systems, protocols of group transmission media</i> • <i>Transmission media</i> (wire, fibre optic and wireless connections).
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Temeljna literatura in viri/Readings:

Temeljna literatura/Basic literature

- Computer Networks: A System Approach Release Version 6.1 Peterson and Davie, 2019. <https://open.umn.edu/opentextbooks/textbooks/771>.
- Kurose, J. F. in Ross, K. W. (2005). Computer Networking, a top down approach. Pearson Education (Addison Wesley).
- Tanenbaum, A. S. (2003). Computer Networks. 4. izdaja, Prentice Hall PTR.

Priporočljiva literatura/Recommended literature

- Vehovec, A., Humar, I., Potisk, B., Vehovec, B., Guna, J., Žitnik, S., Žitnik, M. (2018). Računalniške komunikacije in omrežja I in II (E-gradivo). https://abito.si/e_gradiva/rko/omrezja.html.

Cilji in kompetence:

Učna enota prispeva predvsem k razvoju naslednjih splošnih in specifičnih kompetenc:

- razvoj komunikacijskih sposobnosti in spretnosti, posebej v mednarodnem okolju,
- fleksibilna uporaba znanja v praksi,
- sposobnost uporabe informacijsko-komunikacijske tehnologije in sistemov na področju upravljanja in poslovanja,
- razumevanje računalniških sistemov in arhitektur,
- znanje o računalniških komunikacijah,
- zavedanje o prednostih in slabostih računalniških omrežij in informacijsko komunikacijskih storitev,
- poznavanje aktualne varnostne problematike in sposobnost identificiranja potencialnih nevarnosti s tehnološkimi možnostmi za njihovo preprečevanje.

Objectives and competences:

The learning unit mainly contributes to the development of the following general and specific competences:

- development of communication abilities and skills, especially in the international environment,
- flexible use of knowledge in practice,
- the ability to use information and communication technology and systems in the field of business and management,
- understanding of computer systems and architectures,
- knowledge of computer communications,
- awareness of the advantages and weaknesses of computer networks and information and communication services,
- knowledge of current security problems and the ability to identify potential threats with technological possibilities for their prevention.

Predvideni študijski rezultati:

Znanje in razumevanje:

Študent/Študentka pozna in razume:

- gonila razvoja komunikacijskih sistemov,
- različne vrste in načine povezovanja in komuniciranja,
- strukture in arhitekture informacijsko komunikacijskega sistema ter njune medsebojne soodvisnosti,
- pomen večplastnosti in vloge ter mehanizem delovanja plasti,
- komunikacijska pravila in njihov zapis v obliki protokola,
- delovanje osnovnih komunikacijskih protokolov,
- varnost oziroma nevarnost posameznih aktualnih tehnologij,
- osnovne varnostne mehanizme in sposobnost ovrednotenja nivoja varnosti, ki jo ti dejansko zagotavljajo,
- ter zna uporabiti informacijske storitve, ki so na voljo v

Intended learning outcomes:

Knowledge and understanding:

Students know and understand:

- the driving force of the development of communication systems,
- various types and methods of connections and communication,
- structures and architectures of an information and communication system and their interdependence,
- the importance of multi-layering and the role and mechanism of the functioning of layers,
- communication rules and their record in the form of a protocol,
- the functioning of the basic communication protocols,
- security or threat of individual current technologies,
- the basics of security mechanisms and should be able to assess the level of security that is actually ensured by these mechanisms,

<p>informacijsko-komunikacijskem sistemu,</p> <ul style="list-style-type: none"> • delovanje transportne, omrežne in povezavne plasti, • različne prenosne medije in je sposob-en/-na evalvacije primernosti glede na okoliščine, • aktualno literaturo s tega področja in lahko kritično ovrednoti vsebino glede na usvojeno znanje, • ter lahko v povezavi z drugimi predmeti ovrednoti primernost uporabe komunikacijskih tehnologij, njihovih prednosti in slabosti ter morebitnih nevarnosti v danih okoliščinah. 	<ul style="list-style-type: none"> • the use of information services that are available in an information and communication system, • the functioning of the transport, network and connection layers, • various transmission media and should be able to evaluate the suitability with regard to circumstances, • current literature in this field and should critically assess the content with regard to the knowledge gained, • in connection with other courses, should assess the suitability of the use of communication technologies, their advantages and weaknesses as well as potential threats in given circumstances.
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Metode poučevanja in učenja:

- *predavanja* z aktivno udeležbo študentov (razlaga, diskusija, prikaz na računalniku),
- *laboratorijske vaje* (praktična uporaba predstavljenih konceptov, prikaz uporabe ustreznih tehnologij, komentar),
- *individualne in skupinske konzultacije* – osebno in prek elektronskih medijev,
- *samostojni študij* z izdelavo seminarske naloge.

Learning and teaching methods:

- *lectures* with active participation of students (explanation, discussion, computer presentation),
- *laboratory work* (practical use of presented concepts, presentation of appropriate technologies, commentary),
- *individual and group consultations* – in person and via electronic media,
- *independent study* with the preparation of the seminar paper.

Delež (v %)

Načini ocenjevanja:

Weight (in %)

Assessment:

<p>Načini:</p> <ul style="list-style-type: none"> • pisni (ustni) izpit • izdelava, predstavitev in zagovor seminarske naloge 	<p>60 40</p>	<p>Types:</p> <ul style="list-style-type: none"> • written (oral) exam • preparation, presentation and defence of the seminar paper
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