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| **UČNI NAČRT PREDMETA / COURSE SYLLABUS** | | | | | | | | | | | | | | | | | |
| **Predmet:** | | | Internetna omrežja 1 | | | | | | | | | | | | | | |
| **Course title:** | | | Internet Networks I | | | | | | | | | | | | | | |
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| **Študijski program in stopnja**  **Study programme and level** | | | | | **Študijska smer**  **Study field** | | | | | | | | **Letnik**  **Academic year** | | **Semester**  **Semester** | | |
| Podiplomski magistrski študijski program druge stopnje Elektrotehnika | | | | | Telekomunikacije | | | | | | | | 1 | | 1 | | |
| 2nd cycle masters study programme in Electrical Engineering | | | | | Telecommunications | | | | | | | | 1 | | 1 | | |
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| **Vrsta predmeta / Course type** | | | | | | | | | | | | Obvezni-strokovni / Compulsory professional | | | | | |
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| **Univerzitetna koda predmeta / University course code:** | | | | | | | | | | | | 64237S | | | | | |
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| **Predavanja**  **Lectures** | **Seminar**  **Seminar** | | | **Vaje**  **Tutorial** | | | **Klinične vaje**  **work** | | | | **Druge oblike študija** | | | **Samost. delo**  **Individ. work** | |  | **ECTS** |
| **45** |  | | | **30** | | |  | | | |  | | | **75** | |  | **6** |
|  | | | | | | | | | | | | | | | | | |
| **Nosilec predmeta / Lecturer:** | | | | | Andrej Kos, Janez Bešter | | | | | | | | | | | | |
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| **Jeziki /**  **Languages:** | | **Predavanja / Lectures:** | | | | Slovenščina / Slovenian  Angleški (mentorsko) / English (consultations) | | | | | | | | | | | |
| **Vaje / Tutorial:** | | | | Slovenščina / Slovenian  Angleški (mentorsko) / English (consultations) | | | | | | | | | | | |
| **Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:** | | | | | | | | |  | **Prerequisits:** | | | | | | | |
| Vpis v letnik. | | | | | | | | |  | Enrolment in the year of the course. | | | | | | | |
| **Vsebina:** | | | | | | | |  | | **Content (Syllabus outline):** | | | | | | | |
| Osnovni koncepti omrežij (povezave, hierarhija, omrežni elementi, terminalska oprema, povezavnost). Arhitektura omrežij (dostop, agregacija, jedro, storitveni podsistemi). Širokopasovna omrežja in storitve. Dostopovna fiksna in mobilna omrežja ter tehnologije.  Arhitektura paketnih stikal. Ethernet tehnologija in omrežne storitve. Arhitektura, protokoli in storitve protokolnega sklada TCP/IP. Osnove usmerjanja. Napredno usmerjanje (algoritmi in mehanizmi). Omrežne tehnologije in storitve internetnega protokola verzije 6. Multicast prenosni način. Varnostni algoritmi, protokoli in varnostne storitve omrežij. | | | | | | | |  | | Basic network concepts (connections, hierarchies, network elements, terminals, connection orientation). Network architectures (access, aggregation, core, service subsystems). Broadband networks and services. Fixed and mobile access networks and technologies. Packet switches architecture. Ethernet technologies and network services. Architectures, protocols and services in  TCP/IP protocol stack. Routing fundamentals. Advanced routing algorithms and mechanisms. Internet protocol version 6 networking technologies and services. Multicast distribution. Network security algorithms, protocols and services. | | | | | | | |

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| **Temeljni literatura in viri / Readings:** | | | | | |
| 1. Comer, D.: Internetworking with TCP/IP, Vol 1 (6th Edition), ISBN-10: 013608530X, 2013, Addison-Wesley. 2. Tannenbaum, A.S.: Computer networks, 5th ed., international ed., ISBN 978-0-13-255317-9, 2011, Pearson. 3. Stallings, W.: Data and computer communications, 10th ed., ISBN 978-0-13-350648-8, 2013, Pearson. 4. Medhi, D., Ramasamy, K.: Network Routing: Algorithms, Protocols, and Architectures, ISBN 978-0-120-88588-6, 2007, Elsevier : M. Kaufmann Publishers. 5. Članki, objavljenih v revijah, npr. / Articles published in magazines, i.e.: IEEE Communications Surveys & Tutorials, <http://www.comsoc.org/livepubs/surveys/index.html> | | | | | |
| **Cilji in kompetence:** | |  | | **Objectives and competences:** | |
| Cilj predmeta je podati koncepte, arhitekture in protokole v sodobnih komunikacijskih omrežjih. Poudarek je na vidikih in procesih prenosa prometa z internetnim protokolom.  Študenti bodo pridobili potrebna znanja in veščine s teh področij. | |  | | The objective of the course is to provide an overview of concepts, architectures and protocols in modern telecommunication networks. The focus is on network transfer process with internet protocol.  Students will acquire fundamental knowledge and skills in these fields. | |
| **Predvideni študijski rezultati:** | | |  | **Intended learning outcomes:** | |
| Poznavanje in razumevanje konceptov, arhitektur in protokolov v sodobnih internetnih komunikacijskih omrežjih. | | |  | Knowledge and understanding of concepts, architectures and protocols in modern internet communication networks. | |
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| **Metode poučevanja in učenja:** | | |  | **Learning and teaching methods:** | |
| Predavanja, na katerih se študent seznani s teoretičnimi osnovami, ter laboratorijske vaje, kjer probleme spozna tudi praktično in jih v timu rešuje skozi projektno delo. Eizobraževanje. Ogledi in vabljeni predavatelji. | | |  | Lectures for theoretical aspects,  laboratory exercises and team work for real-case scenarios and problem solving through project work. Elearning. Study visits and invited lecturers. | |
| **Načini ocenjevanja:** | Delež (v %) /  Weight (in %) | | | | **Assessment:** |
| Način: pisni izpit, ustni izpit.  Ocene od 1 do vključno 5 so negativne, ocene od vključno 6 do 10 so pozitivne.  Uspešna izvedba 80% laboratorijskih vaj je predpogoj za prijavo na pisni izpit.  Prispevki k oceni:   * pisni izpit * ustni izpit | 50%  50% | | | | Type: written exam, oral exam.  Negative grades: from 1 to 5, positive grades: from 6 to 10.  Successful completion of at least 80% of the laboratory exercises is prerequisite for the written exam.  Contributions to final grade:   * written exam * oral examination |
| **Reference nosilca / Lecturer's references:** | | | | | |
| 1. KOS, Andrej, HOMAN, Peter, BEŠTER, Janez. Performance evaluation of a synchronous bulk packet switch under real traffic conditions. IEICE transactions on communications, ISSN 0916-8516, 2003, vol. E86-B, no. 5, str. 1612-1624. 2. KOS, Andrej, VOLK, Mojca, BEŠTER, Janez. Quality assurance in the IMS-based NGN environment. V: CRANLEY, Nicola (ur.), MURPHY, Liam (ur.). Handbook of research on wireless multimedia: quality of service and solutions. Hershey; New York: Information Science Reference, cop. 2009, str. 240-257. 3. RUGELJ, Miha, STERLE, Janez, KOS, Andrej. Funkcionalna in zmogljivostna primerjava odprtokodnih in komercialnih rešitev multicast. Elektrotehniški vestnik, ISSN 0013-5852. [Slovenska tiskana izd.], 2011, letn. 78, št. 4, str. 211-216. 4. KOS, Andrej, BEŠTER, Janez. Razvoj in uvajanje novih telekomunikacijskih storitev. Elektrotehniški vestnik, ISSN 0013-5852. [Slovenska tiskana izd.], 2002, letn. 69, št. 3-4, str. 221-226. 5. RUGELJ, Miha, VOLK, Mojca, SEDLAR, Urban, STERLE, Janez, KOS, Andrej. A novel user satisfaction prediction model for future network provisioning. Telecommunication systems, ISSN 1018-4864. [Print ed.], Jul. 2014, vol. 56, no. 3, str. 417-425. | | | | | |