UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Uvod v informatiko
Course title:	Introduction to Informatics

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year
NOO projekt piloti: Naprednejša računalniška znanja (nivo: visokošolski strokovni študijski program)	Programiranje in razvoj aplikacij	2023/24
RRP pilot project: Advanced computer skills (level: first cycle professional study programme)	Programming and application development	2023/24

Vrsta predmeta / Course type | Obvezni / Obligatory

Univerzitetna koda predmeta / University course code: | NOO-PRA-VS-UVI-2023-24

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	-	30	-	-	120	6

Nosilec predmeta / Lecturer: | izr. prof. dr. Simon Vrhovec

Jeziki /	**Predavanja /**	Slovenski / Slovenian, Angleški / English
Languages:	**Lectures:**	
	Vaje / Tutorial:	Slovenski / Slovenian, Angleški / English

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Pogoj za pristop k izpitu so opravljene naloge na vajah.	The prerequisites to attending the exam are completed exercises.

Vsebina:	**Content (Syllabus outline):**
• Uvod v predmet. Povezanost predmeta z drugimi predmeti, vsebina predmeta, študijska literatura. • Uvod v informatiko. Teoretična in praktična znanstvena disciplina, Zgodovinski razvoj. Koncept informacijske družbe in pomen informatike. Ključni trendi na področju informatike. Pojav odprte kode. • Pomen in vloga informacijske tehnologije v razvoju informatike. Vpliv informacijske tehnologije na družbo.	• Introduction to the course. Links with other courses, course content, study literature. • Introduction to informatics. Theoretical and practical discipline, history. The concept of information society and the importance of information technology. Key trends in the field of informatics. The Open Source phenomenon. • The importance and role of information technology in the development of

- Matematične osnove računalništva, digitalni zapis podatkov, teorija informacije, redundanca, kompresija, dvojiški številčni sistem, Boolova algebra.
- Informacija in podatek, vrednost informacije.
- Strukturni elementi informacijske tehnologije. Strojna, komunikacijska in programska oprema. Podatkovni mediji.
- Sistemska programska oprema. Operacijski sistemi.
- Tehnologije sodobnih informacijskih rešitev: virtualizacija, nivoji virtualizacije, Računalništvo v oblaku (Cloud computing), Programska oprema kot storitev (Software as a service) (SaaS), Storitveno usmerjena arhitektura (Service-oriented architectures (SOAs)
- Razvijanje programske opreme. Analiza, specifikacija, programiranje, testiranje, uvajanje in vzdrževanje.
- Osnove algoritmov in programski jeziki.
- Pomen in vloga informacijske tehnologije v ustvarjanju in prenosu znanja. Inteligentni sistemi in umetna inteligenca.
- Računalniške komunikacije; terminologija; topologije omrežij; OSI nivoji; internetni protokoli.
- Informacijska varnost, varnostni mehanizmi in grožnje, infrastruktura javnih ključev, varnostni standardi in zakonodaja.
- Podatkovni tipi, predstavljanje in organiziranje podatkov. Modeliranje in modeli podatkov. Relacijske baze podatkov.

- informatics. The impact of information technology on society.
- Mathematical fundamentals of computer science, digital data, information theory, redundancy of data, data compression, binary system, Boole algebra.
- Information and data, value of information.
- Structural elements of information technology. Hardware, communication equipment, software. Data Storage Media.
- System software. Operating systems.
- Modern information technologies: virtualisation, levels virtualisation, Cloud computing, Software as a service (SaaS), Service-oriented architectures (SOAs)
- Software development. Analysis, specification, programming, testing, deployment and maintenance.
- Algorithm fundamentals and programming languages.
- The importance and role of information technology in creating and transferring knowledge. Intelligent systems and artificial intelligence.
- Computer communications; terminology; network topology; OSI Layers; Internet protocols.
- Information security, security mechanisms and threats, public key infrastructure, information security standards and legislation.
- Data types, presentation and organization of data. Modelling and data models. Relational databases.

Temeljni literatura in viri / Readings:

- Šuhel, P., Paulin, A. & Šuhel, P. (2011). *Uvod v informatiko*. Samozaložba.
- Gradišar, M. (2003). *Uvod v informatiko*. Ljubljana: Ekonomska fakulteta.
- Stair, R. & Reynolds, G. (2020). *Principles of Information Systems* (14th ed.). Boston: Cengage Learning.

Cilji in kompetence:

Učna enota prispeva k razvoju naslednjih splošnih in predmetno-specifičnih kompetenc:

Splošne kompetence:
- poznavanje osnov računalništva in informacijske tehnologije
- poznavanje in razumevanje procesov, ki jih je mogoče informacijsko podpreti z uporabo spletnih tehnologij, ter sposobnost za njihovo analizo, sintezo in izbiro rešitev ter predvidevanje njihovih posledic
- zmožnost za prepoznavanje in izkoriščanje priložnosti, ki jih ponuja spletna tehnologija
- poznavanje in razumevanje interakcij med informacijsko komunikacijsko tehnologijo in posameznikom
- sposobnost fleksibilne uporabe znanja v praksi

Predmetno-specifične kompetence:
- poznavanje temeljnih definicij in idej v računalništvu in informatiki.
- poznavanje najpogostejših groženj varnosti in uporaba praktičnih postopkov za zagotavljanje varnosti informacijskega sistema.
- razumevanje zmogljivosti komponent računalniškega sistema in omrežnih naprav.
- komuniciranje s strokovnjaki v informacijski dejavnosti z uporabo ustrezne terminologije.
- poznavanje etičnih dilem uporabe informacijskih rešitev in temeljne zakonodaje na tem področju.

Objectives and competences:

The instructional unit contributes to the development of the following general and subject-specific competences:

General competences:
- familiarity with the basics of computer science and information technology
- familiarity with and understanding of processes allowing information-aided use of web technologies, and the ability to analyse and synthesize them as well as select solutions and predict their consequences
- ability to recognize and seize opportunities offered by the web technology
- familiarity and understanding of interactions existing between the information and communication technology and the individual
- ability to use the acquired knowledge in practice in a flexible manner

Subject-specific competences:
- knowledge of fundamental definitions and ideas in computer science and informatics
- familiarity with the most frequent security threats and the use of practical procedures ensuring information system security.
- understanding capabilities of computer system components and network devices.
- communication with information technology experts using appropriate terminology.
- familiarity with ethical dilemmas relating to the use of information solutions, as well as knowledge with regard to the field-specific legislation.

Predvideni študijski rezultati:

Znanje in razumevanje:

Študent/študentka:
- spozna temeljne definicije in ideje ter terminologijo v računalništvu in informatiki, kar mu/ji omogoči

Intended learning outcomes:

Knowledge and understanding:

The student:
- learns about the basic definitions and terminology and ideas in computer science and informatics, allowing them

komuniciranje z drugimi strokovnjaki na področju računalništva in informatike		to communicate with other professionals in the field of computer science	
• se seznani z zgradbo in strukturnimi elementi informacijskih sistemov		• is acquainted with the structure and structural elements of information systems	
• obvlada osnovna pisarniška orodja,		• gains command of basic office tools	
• razume in uporablja praktične postopke za zagotavljanje varnosti informacijskega sistema		• understands and can apply practical methods for ensuring information system security	
• spozna temeljno zakonodajo, relevantno za področje računalništva in informatike ter etične dileme razvoja in uporabe informacijskih sistemov		• gains an understanding of fundamental legislation, relevant to the field of computer science and the ethical dilemmas of development and use of information systems	

Metode poučevanja in učenja:

- *predavanja* z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri, reševanje problemov)
- *laboratorijske vaje* (delo na osebnem računalniku, spoznavanje opreme, omrežij, operacijskih sistemov, baz podatkov, iskanje sekundarnih podatkov, internetnih virov ipd.)
- individualne in skupinske *konzultacije* (diskusija, dodatna razlaga, obravnava specifičnih vprašanj)

Learning and teaching methods:

- *lectures* with the active participation of students (presentation, discussion, questions, cases, problem solving)
- *lab work* (work on a personal computer, familiarization with hardware, networks, operating systems, databases, searching for secondary data, internet resources, etc..)
- individual and group *consultation* (discussion, additional explanation, consideration of specific issues)

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Način (pisni izpit, ustno izpraševanje, naloge, projekt):		Type (examination, oral, coursework, project):
• pisni izpit	50	• written exam
• opravljene naloge na vajah	50	• completed exercises

Reference nosilca / Lecturer's references:

- BESEDNJAK VALIČ, Tamara, KOLAR, Janez, LAMUT, Urša. Fighting the big bad wolf of global trends : technology transfer between HPC centres and SMEs. Digital policy, regulation and governance, ISSN 2398-5038, 2021, vol. , iss. , 15 str., ilustr. https://www.emerald.com/insight/content/doi/10.1108/DPRG-11-2020-0162/full/html, doi: 10.1108/DPRG-11-2020-0162. [COBISS.SI-ID 69016835]
- KOVAČIČ, Andrej, RASPOR, Andrej, KOLAR, Janez, ŽEZLINA, Janez. Absenteeism in Slovenian companies. Innovative issues and approaches in social sciences, ISSN 1855-0541, 2021, vol. 14, no. 1, str. 19-32, ilustr. http://dx.doi.org/10.12959/issn.1855-0541.IIASS-2021-no1-art2, doi: 10.12959/issn.1855-0541.IIASS-2021-no1-art2. [COBISS.SI-ID 43637251]
- BESEDNJAK VALIČ, Tamara, KOLAR, Janez, LAMUT, Urša. Three scenarios of innovation and technology transfer : the case of key enabling technologies in the Danube Region. Journal of engineering and applied sciences, ISSN 1816-949X, 2020, vol. 15, iss. 21, str. 3619-3623, ilustr., doi: 10.36478/jeasci.2020.3619.3623. [COBISS.SI-ID 38875139]
- KOLAR, Janez. Opportunities for acceleration of diffusion of technology with a little help of organizational culture. V: WEIS, Lidija (ur.), KOVAL, Viktor (ur.), AŠKERC

ZADRAVEC, Katarina (ur.). Workshop on Social Research : Eastern European Conference of Management and Economics : EECME 2020 : proceedings of the 2nd international scientific conference : May 29, 2020, Ljubljana, Slovenia. Ljubljana: Ljubljana School of Business. 2020, str. 85-94, ilustr. https://www.vspv.si/uploads/visoka_sola/datoteke/workshop_eecme_2020_-_proceeding_of_conference__ljubljana_school_of_business.pdf. [COBISS.SI-ID 20283395]

- BESEDNJAK VALIČ, Tamara, KOLAR, Janez, LAMUT, Urša. Understanding the role of social networks in the digital transformation and technology transfer : case of academic HPC centres and SMEs in the Danube region. V: ERMAN, Nuša (ur.). 12th International Conference on Information Technologies and Information Society : ITIS 2021 : book of abstracts : November 4-5, 2021 Dolenjske Toplice, Slovenia. Novo mesto: Faculty of Information Studies. 2021, str. 24. http://itis.fis.unm.si/wp-content/uploads/2022/01/ITIS-2021-Book-of-Abstracts.pdf. [COBISS.SI-ID 93300483]

- KOLAR, Janez. Osebna uspešnost 4.0 = Personal performance 4.0. V: FINK GRUBAČEVIĆ, Iris (ur.), URŠIČ, Urška (ur.). Priložnosti, potenciali, izzivi : zbornik povzetkov = Opportunities, potentials, challenges : conference proceedings abstracts. Novo mesto: Fakulteta za industrijski inženiring: = Faculty of Industrial Engineering. 2018, str. 15-16. http://www.fini-unm.si/media/3__Zbornik_povzetkov_ang.pdf. [COBISS.SI-ID 1553654]

- KOLAR, Janez. Possible connections between global competitiveness index, world happiness index and cultural dimensions in Danube river region countries through the prism of social fields theory. V: BELE, Darko (ur.), WEIS, Lidija (ur.), MAHER, Neva (ur.). Sustainable development under the conditions of European integration : collective monograph. Ljubljana: VŠPV, Visoka šola za poslovne vede: = Ljubljana School of Business. 2019, zv. 1, str. 197-204, ilustr. [COBISS.SI-ID 2048475928]

- KOLAR, Janez, BESEDNJAK VALIČ, Tamara. Social aspects of technology diffusion : Danube Region HPC Case. London; Budapest; Ljubljana: Vega Press, cop. 2021. 1 spletni vir (1 datoteka PDF (109 str.)), ilustr. ISBN 978-1-909736-28-3. https://www.zalozbavega.com/product-page/social-aspects-of-technology-diffusion-danube-region-hpc-case. [COBISS.SI-ID 87568387]