

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	Semester Semester
Razvoj videoiger in razširjenih resničnosti, visokošolski strokovni študijski program prve stopnje	-	Prvi	Prvi
Game and Extended Reality Development, first cycle Professional Study Programme	-	First	First

Vrsta predmeta / Course type

Obvezni / Obligatory

Univerzitetna koda predmeta / University course code:

4-RVRR-VS-UVI-2025-02-27

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	-	45	-	-	105	6

Nosilec predmeta / Lecturer: izr. prof. dr. Blaž Rodič

Jeziki / Languages:

Predavanja / Lectures: Slovenski / Slovenian, Angleški / English

Vaje / Tutorial: Slovenski / Slovenian, Angleški / English

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

Študent/študentka mora pred pristopom k izpitu pripraviti in zagovarjati empirično seminarsko nalogo in opraviti obveznosti iz vaj.

Prerequisites:

The student is obliged to prepare and defend his/her empirical seminar paper and complete lab work assignments before the admission to the exam.

Vsebina:

- 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.

Content (Syllabus outline):

- 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.

- Pomen in vloga informacijske tehnologije v razvoju informatike. Vpliv informacijske tehnologije na družbo.
- 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.

- The importance and role of information technology in the development of 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:

- Erjavec, J., Gradišar, M., Jaklič, J., Tomat, L., Turk, T. (2023). *Osnove poslovne informatike*, Ljubljana : Ekonomska fakulteta.
- Bavec, C., Kovačič, A., Krisper, M., Rajkovič, V., Vintar, M. (2019). *Slovenija na poti digitalne preobrazbe*, Založba UL FRI.
- 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:

- usposobljenost za izvajanje vseh faz razvoja programskih rešitev: načrtovanje, razvoj, testiranje, implementacija in vzdrževanje.
- sposobnost samostojnega sledenja najnovejšim tehnološkim dosežkom in pridobivanja novih znanj, ki so uporabna v produkciji videoiger in virtualne resničnosti.
- sposobnost analitičnega in algoritmičnega razmišljanja.
- obvladovanje sodobnih orodij in specializirane programske opreme za obdelavo podatkov.

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:

- ability to perform all phases of software development: design, development, testing, implementation and maintenance.
- ability to independently keep up to date with the latest technological developments and gain new skills useful in video game and extended reality production.
- ability of analytical and algorithmic thinking.
- expertise in modern data processing tools and specialised software.

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 komuniciranje z drugimi strokovnjaki na področju računalništva in informatike
- se seznanja z zgradbo in strukturnimi elementi informacijskih sistemov
- obvlada osnovna pisarniška orodja,

Intended learning outcomes:

Knowledge and understanding:

The student:

- learns about the basic definitions and terminology and ideas in computer science and informatics, allowing them to communicate with other professionals in the field of computer science
- is acquainted with the structure and structural elements of information systems

- razume in uporablja praktične postopke za zagotavljanje varnosti informacijskega sistema
- spozna temeljno zakonodajo, relevantno za področje računalništva in informatike ter etične dileme razvoja in uporabe informacijskih sistemov

- gains command of basic office tools
- understands and can apply practical methods for ensuring information system security
- 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 osebni 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): <ul style="list-style-type: none"> • pisni izpit • empirična seminarska naloga s poročili seminarskega dela in eksperimentalnih vaj ter predstavitev naloge 	50 50	Type (examination, oral, coursework, project): <ul style="list-style-type: none"> • written exam • empirical seminar report on project work and laboratory work and the presentation

Reference nosilca / Lecturer's references:

- RODIČ, Blaž, BARBO, Matej. Decision support for traffic safety : case of rear-end collision modelling. Journal of decision systems. [2024, str. 1-12. ISSN 1246-0125. DOI: 10.1080/12460125.2024.2372481
- BARBO, Matej, RODIČ, Blaž. Modeling the influence of safety aid market penetration on traffic safety : case of collision warning system for powered two-wheelers. Accident analysis and prevention. [Print ed.]. 2023, vol. 192 (107240), str. 1-11, ilustr. ISSN 0001-4575. DOI: 10.1016/j.aap.2023.107240.
- RODIČ, Blaž. Industry 4.0 and the new simulation modelling paradigm. Organizacija : revija za management, informatiko in kadre, ISSN 1318-5454. [Tiskana izd.], aug. 2017, vol. 50, no. 3, str. 193-207, ilustr., doi: 10.1515/orga-2017-0017
- BRELIH, Marjan, RAJKOVIČ, Uroš, RUŽIČ, Tomaž, RODIČ, Blaž, KOZELJ, Daniel. Modelling decision knowledge for the evaluation of water management investment projects. Central European journal of operations research. Sep. 2019, vol. 27, iss. 3, str. 759-781, ilustr. ISSN 1435-246X. <https://link.springer.com/article/10.1007/s10100-018-0600-5>, DOI: 10.1007/s10100-018-0600-5.
- KANDUČ, Tadej, RODIČ, Blaž. Optimisation of machine layout using a force generated graph algorithm and simulated annealing. International journal of simulation modelling, ISSN 1726-4529, 2016, vol. 15, no. 2, str. 275-287.

- RODIČ, Blaž, BAGGIA, Alenka. Dynamic airport ground crew scheduling using a heuristic scheduling algorithm. International journal of applied mathematics and informatics, ISSN 2074-1278, 2013, vol. 7, iss. 4, str. 153-163.
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