

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Razvoj programske opreme
Course title:	Software Development

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Računalništvo in spletne tehnologije, magistrski študijski program druge stopnje	-	Drugi	Tretji
Computer science and web technologies, second cycle Master's Study Programme	-	Second	Third

Vrsta predmeta / Course type

Obvezni / Obligatory

Univerzitetna koda predmeta / University course code:

2-RST-MAG-RPO-2026-09-29

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 imeti pozitivno ocenjene vaje in seminarsko nalogo.

Predmet zahteva predznanja o podatkovnih strukturah in algoritmih pridobljena v okviru predmetov Programiranje in Algoritmi.

Prerequisites:

Positively evaluated exercises and seminar paper are a prerequisites for exam.

Course requires knowledge of data structures and algorithms obtained within the courses Programming and Algorithms.

Vsebina:

- Uvod v predmet:
Namen študija predmeta, povezanost predmeta z drugimi predmeti, vsebina študija predmeta, študijska literatura.
- Življenjski cikel programske opreme:
strategija, načrtovanje, analiza, oblikovanje, razvoj, uvajanje in vzdrževanje.
- Pregled metodologij razvoja informacijskih sistemov.

Content (Syllabus outline):

- Introduction:
The purpose of the subject, connections with other subjects, subject contents, study literature.
- Software lifecycle:
strategy, planning, design, development, deployment, operation and maintenance, support.
- Overview of information systems development methodologies.

- Karakteristike metodologij in izbira metodologije.
- Strukturne metode razvoja programske opreme
- Objektni orientirani razvoj, Poenoteni proces.
- Agilne metodologije: SCRUM, Kanban, Lean development, XP
- Zajem in analiza uporabniških zahtev
- Modeliranje procesov in podatkov, objektno modeliranje z UML.
- Testiranje programske opreme, zagotavljanje kvalitete.
- Dokumentiranje programske opreme.

- Characteristics of methodologies and methodology selection.
- Structured software development methods
- Object oriented development, Unified Process, UML based modelling
- Agile methodologies: SCRUM, Kanban, Lean development, XP
- User requirements gathering and analysis.
- Process and data modelling, object based modelling with UML.
- Software testing, quality management.
- Software documentation.

Temeljni literatura in viri / Readings:

- VALACICH, J., GEORGE, J., Modern Systems Analysis and Design (8th Edition), Pearson, 2017
- DENNIS, A., WIXOM, B., TEGARDEN, D., Systems Analysis and Design with UML 4th Edition, Wiley, 2012
- WHITTEN, JEFFREY L. in BENTLEY, LONNIE D. (2007) *Introduction to Systems Analysis and Design*. McGrawHill.
- METCALFE, G., Scrum Project Management, Gary Metcalfe, 2018.
- LARMAN, C., Agile and Iterative Development: A Manager's Guide, Addison-Wesley, 2003.

Cilji in kompetence:

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

Splošne kompetence:

- sposobnost algoritmičnega razmišljanja.
- razvoj kritične in samokritične presoje
- sposobnost fleksibilne uporabe znanja v praksi;
- uporaba metodoloških orodij, t.j. izvajanje, koordiniranje in organiziranje raziskav, uporaba raznih raziskovalnih metod in tehnik;
- usposobljenost za samostojno in avtonomno uporabo, nadzor in vzdrževanje informacijsko komunikacijske tehnologije v organizaciji;
- sposobnost obvladovanja in pretvorbe realnega problema v obliki lažje predstavljivega modela.

Predmetno-specifične kompetence:

- sposobnost izbire uporabe informacijsko-komunikacijske

Objectives and competences:

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

General competences:

- ability of algorithmic thinking;
- the development of critical and self-critical assessment;
- the use of methodological tools, i.e. implementation, coordination and organization of research, the use of different research methods and techniques;
- the ability to manage and maintain an information system and individual applications of information communication technology;
- ability to manage and transform a real-life problem into the form of an easier to perceive model.

Subject-specific competences:

- the ability to choose information and communication technologies, tools and systems for designing and implementing information systems

tehnologije, orodij in sistemov za načrtovanje informacijskih sistemov • samostojno reševanje zahtevnih razvojnih in inženirskih in organizacijskih nalog na področju razvoja programske opreme.	• independently tackle demanding developmental and engineering tasks in software development
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Predvideni študijski rezultati:

Znanje in razumevanje:

Študent/študentka:

- prepozna procese, ki jih je mogoče informacijsko podpreti z informacijskim sistemom
- je zmožen identificirati prispevek informacijskega sistema k dodani vrednosti organizacije
- pozna in razume življenjski cikel programske opreme
- pozna in razume prednosti in pomanjkljivosti različnih metodologij in tehnik za analizo in razvoj programske opreme
- pozna in uporablja metode in tehnike informacijskega inženiringa
- pozna in uporablja osnovne elemente jezika UML
- pozna in uporablja tehnike agilnega razvoja
- je zmožen sodelovati pri analizi in razvoju informacijskega sistema organizacije
- je zmožen sinteze znanj in metod pri razvoju programske opreme

Intended learning outcomes:

Knowledge and understanding:

The student:

- recognizes processes that can be supported by an information system
- is able to identify the contribution of the IS to the organization's added value
- knows and understands software lifecycle
- knows and understands the strengths and weaknesses of various analysis and development methodologies and techniques
- knows and uses information engineering methods and techniques
- knows and uses elementary UML syntax
- knows and uses agile development techniques
- is able to take part in information system analysis and development activities
- is able to conduct a synthesis of knowledge and methods in software development

Metode poučevanja in učenja:

- *predavanja* z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri, reševanje problemov)
- *laboratorijske vaje* (delo na osebem računalniku, spoznavanje različnih vrst informacijskih sistemov, spoznavanje orodij za analizo, uporaba različnih diagramskih tehnik)
- *individualne in skupinske konzultacije* (diskusija, dodatna razlaga, obravnava specifičnih vprašanj)

Learning and teaching methods:

- *lectures* with emphasis on students' activity (explanation, discussion, cases, problem solving)
- *laboratory training* (work on a personal computer, getting acquainted with several kinds of information systems, learning to use analysis tools and diagramming techniques)
- individual and group consultations (discussion, additional explanation, specific issues)

Delež (v %) /

Načini ocenjevanja:

Weight (in %) **Assessment:**

Način (pisni izpit, ustno izpraševanje, naloge, projekt):		Type (examination, oral, coursework, project):
• pisni izpit • empirična seminarska naloga, poročila laboratorijskih vaj	50 % 50 %	• written exam • empirical seminar work, report on laboratory exercises

Reference nosilca / Lecturer's references:

- 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, BARBO, Matej. Decision support for traffic safety : case of rear-end collision modelling. *Journal of decision systems*. [in press] 2024, str. 1-12. ISSN 1246-0125. DOI: [10.1080/12460125.2024.2372481](https://doi.org/10.1080/12460125.2024.2372481).
- 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, ISSN 1435-246X, 2018, vol. , iss. , str. <https://link.springer.com/content/pdf/10.1007%2Fs10100-018-0600-5.pdf>, 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.
- BARTOL, Tomaž, DOLNIČAR, Danica, BOH PODGORNİK, Bojana, RODIČ, Blaž, ZORANOVIĆ, Tihomir. A comparative study of information literacy skill performance of students in agricultural sciences. *Journal of academic librarianship*. [Print ed.]. 2018, iss. 3, vol. 44, str. 374-382. ISSN 0099-1333. DOI: [10.1016/j.acalib.2018.03.004](https://doi.org/10.1016/j.acalib.2018.03.004).
- ŠAVRIČ, Jerneja, RODIČ, Blaž. Role of information system support in project management : case of companies competing at publicly funded calls for projects. V: PANKOWSKA, Malgorzata (ur.). Digital transformation, perspective development, and value creation : research case studies. New York; Abingdon: Routledge, 2024. Str. [103]-117. Routledge advances in management and business studies. ISBN 978-1-032-45340-8, ISBN 978-1-032-45356-9.