

	UČNI NAČRT PREDMETA/COURSE SYLLABUS
Predmet	Programski inženiring
Course title	Software Engineering

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Poslovna informatika / 1. stopnja	Poslovna informatika	2./3. letnik	4./5.
Business Informatics / 1 st Cycle	Business Informatics	2 nd /3 rd year	4 th /5 th

Vrsta predmeta/Course type izbirni / elective

Univerzitetna koda predmeta/University course code I_PI_IP_UN2

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
30			30		90	6

Nosilec predmeta/Lecturer: dr. Stevanče Nikoloski, pred.
Učni načrt pripravil doc. dr. Sebastian Lahajnar

Jeziki/ Languages: **Predavanja/Lectures:** slovenski/Slovenian
Vaje/Tutorial: slovenski/Slovenian

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

Prerequisites:

<ul style="list-style-type: none"> Vpis v drugi ali tretji letnik študijskega programa. Študent mora pred izpitom doseči minimalne pogoje sprotnega preverjanja. 	<ul style="list-style-type: none"> The prerequisite for inclusion is enrolment in the second or third year of study. Before the exam, the student must achieve the minimum conditions of the on-the-spot check.
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Vsebina:

Content (Syllabus outline):

<ul style="list-style-type: none"> <i>Uvod:</i> Osnove programskega inženiringa, sistemske analize in načrtovanja, upravljanje s poslovnim primerom. <i>Vodenje IT projektov:</i> Tipi projektov, vloga projektnega menedžerja, vzpostavitev 	<ul style="list-style-type: none"> <i>Introduction:</i> Fundamentals of software engineering, system analysis and design, business case management. <i>IT projects management:</i> Project types, the role of the project manager, setting
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<p>strukture projekta, opredelitev opravil, izračun kritične poti, nadzorovanje projekta.</p> <ul style="list-style-type: none"> • <i>Sistemska analiza</i>: uvod v sistemsko analizo. • <i>Modeliranje zahtev</i>: JAD (Joint Application Design), RAD (Rapid Application Development), agilne metodologije, orodja in tehnike za zajem zahtev, • <i>Modeliranje podatkov in procesov</i>: Izdelava diagramov podatkovnih tokov, psevdo koda, načrtovanje modulov, odločitvene tabele. • <i>Objektno modeliranje</i>: Osnovni koncepti objektnega pristopa, objektno modeliranje z UML. • <i>Razvojne strategije</i>: Razvoj znotraj podjetja, zunanje izvajanje, obravnava stroškov in koristi, postopek nabave programske opreme. • <i>Sistemska načrtovanje</i>: Uvod v sistemsko načrtovanje. • <i>Načrtovanje uporabniškega vmesnika</i>: Vodila uspešnega načrtovanja, načrtovanje obrazcev in poročil, vprašanja varnosti in nadzora. • <i>Načrtovanje podatkov</i>: Osnovni koncepti načrtovanja podatkov, komponente sistema za upravljanje podatkovnih baz, diagram ER (Entity Relationship), normalizacija podatkov, shranjevanje in dostop, • <i>Načrtovanje sistemske arhitekture</i>: Tipi sistemskih arhitektur, metode procesiranja podatkov, omrežni modeli, brezžična omrežja. • <i>Implementacija sistemov</i>: Uvod v razvoj aplikacij, objektno usmerjeni pristopi, agilni pristopi, kodiranje, testiranje, dokumentiranje, izobraževanje uporabnikov, prenos podatkov. • <i>Podpora in varnost sistemov</i>: Upravljanje vzdrževanja, zagotavljanje zmogljivosti in razširljivosti, ravni sistemske varnosti, varnostno kopiranje in obnovitev podatkov. 	<p>up the project structure, defining tasks, calculating the critical path, supervising the project.</p> <ul style="list-style-type: none"> • <i>System Analysis</i>: Introduction to System Analysis. • <i>Requirements modelling</i>: Joint Application Design, RAD (Rapid Application Development), agile methodologies, requirements definition tools and techniques, • <i>Data and processes modelling</i>: Creating Data flow diagrams, all about pseudo code, designing modules, decision tables. • <i>Object modelling</i>: Basic concepts of object approach, object modelling with UML. • <i>Development strategies</i>: Internal development, outsourcing, cost-benefit analysis, software purchasing process. • <i>System planning</i>: Introduction to system planning. • <i>User Interface Design</i>: Successful UI design principles, forms and reports design, security and control issues. • <i>Data design</i>: Introducing basic data design concepts, Database Management System components, ER (Entity Relationship) diagram, data normalization, data storage and access, • <i>System architecture design</i>: Types of system architectures, data processing methods, network models, wireless networks. • <i>System implementation</i>: Introduction to application development, object-oriented approaches, agile approaches, coding, testing, documentation, user training, data transfer. • <i>System support and security</i>: Maintenance management, performance and scalability, system security levels, backup and data recovery.
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Temeljna literatura in viri/Readings:

Temeljna literatura/Basic literature

- Tilley, S., Rosenblatt, H. J. (2016). *Systems Analysis and Design, 11th Edition*. Cengage Learning.

Priporočljiva literatura/Recommended literature

- Avison, D., Fitzgerald, G. (2006). *Information Systems Development, 4th Edition*. McGraw-Hill Education.
- Schwaber, K., Beedle, M. (2002). *Agile software development with Scrum*. Upper Saddle River: Prentice Hall.p.XVI, 158.
- Cadle, J. (2014). *Developing information systems: practical guidance for IT professionals*. London: BCS, The Chartered Institute for IT.p.XV, 303.

Cilji in kompetence:

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

- poznavanje in razumevanje procesov v tehniško-tehnološkem ter poslovnem okolju in sposobnost za njihovo analizo, sintezo in predvidevanje rešitev ter njihovih posledic,
- sposobnost definiranja, razumevanja in ustvarjalnega reševanja strokovnih izzivov na področjih računalništva in informatike,
- usposobljenost za pridobivanje novih in poglobljanje pridobljenih strokovnih znanj računalništva in informatike,
- usposobljenost za analizo in načrtovanje sistemov,
- zmožnost opisati dano situacijo s pravilno uporabo matematičnih in računalniških simbolov ter zapisov,
- praktično znanje in veščine pri razvoju programske in strojne opreme ter informacijskih tehnologij, ki so potrebne za uspešno delo na strokovnem področju računalništva in informatike (programiranje, računalniška arhitektura, omrežja itd.),
- usposobljenost za analizo in razvoj strojne in programske opreme,
- poznavanje načinov predstavitve, zapisa in modeliranja informacij,
- usposobljenost za timsko in projektno delo,
- poznavanje zmožnosti in omejitev informacijskih tehnologij.

Objectives and competences:

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

- knowledge and understanding of processes in the technical-technological and business environment, as well as the ability for their analysis, synthesis and prediction of the solutions and their consequences,
- the ability to define, understand and creatively solve professional challenges in the fields of computer science and informatics,
- the ability to acquire new and deepen the acquired professional knowledge of computer science and informatics,
- being qualified to analyze and design systems,
- the ability to describe the given situation with a proper use of mathematical and computer symbols and records,
- practical knowledge and skills in the development of software and hardware and information technologies necessary for successful work in the field of computer science and informatics (programming, computer architecture, networks, etc.),
- being qualified for the analysis and development of hardware and software,
- knowing the ways of presenting, recording and modeling information,

	<ul style="list-style-type: none"> • being qualified for team work and project work, • knowing the capabilities and limitations of information technologies.
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Predvideni študijski rezultati:

Študent/študentka:

- se usposobi za vodenje projektov s področja informacijske tehnologije,
- pozna, razume in uporablja najpomembnejše metode in tehnike načrtovanja, oblikovanja, razvoja, uvajanja in vzdrževanja programske opreme,
- pozna in uporablja osnovne tehnike modeliranja in analize zahtev, uporabniškega vmesnika, podatkov in procesov,
- pozna in uporablja diagramске tehnike jezika UML za objektno analizo in načrtovanje,
- nadgrajuje in uporablja znanje upravljanja z bazami podatkov (modeliranje podatkov, normalizacija),
- pozna različne strategije podjetja za razvoj in upravljanje s programsko opremo,
- se usposobi za pisanje in ustvarjanje funkcijske specifikacije projektov za razvoj programske opreme.

Intended learning outcomes:

Students:

- develop skills in the management of IT projects,
- know, understand and use the most important methods and techniques of software design, development, deployment and maintenance,
- know and use the basic techniques for modelling and analysis of user requirements, user interface, data and processes,
- know and use UML language diagramming techniques for object analysis and design,
- upgrade and use the knowledge of database management (data modelling, normalization),
- know different company development strategies and software management,
- are qualified for independent analysis and design of organization's information requirements,
- develop skills for writing and creating functional specifications for software development projects.

Metode poučevanja in učenja:

- *predavanja* z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri, reševanje problemov),
- *laboratorijske vaje*: refleksija izkušenj, praktično reševanje več tipičnih problemov na računalniku, predstavitev in zagovor programskih rešitev, diskusija, sporočanje povratne informacije, uporaba orodij za agilni razvoj programske opreme.

Learning and teaching methods:

- *lectures* with active student participation (explanation, discussion, questions, examples, problem solving),
- *laboratory work*: reflection on experience, practical solving of several typical problems on a computer, presentation and defence of programming solutions, discussion, feedback, using tools for agile software development.

Načini ocenjevanja:	Delež (v %) Weight (in %)	Assessment:
Načini: <ul style="list-style-type: none"> • zaključno preverjanje: pisni ali ustni izpit, • sprotno preverjanje: aktivno delo na projektu. Ocenjevalna lestvica: ECTS.	60 % 40 %	Types: <ul style="list-style-type: none"> • final examination: written or oral exam, • ongoing verification: active work on the project. Grading scheme: ECTS.