



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Razvoj informacijskih rešitev in storitev
Course title:	Development of Information Systems and Services

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester
Izobraževalno računalništvo 2. stopnja	/	2.	Zimski/ Autumn
Educational computer science 2nd level	/		

Vrsta predmeta / Course type

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
30			30		90	5

Nosilec predmeta / Lecturer:

Jeziki /	Predavanja / Lectures:	slovenski / slovene
Languages:	Vaje / Tutorial:	slovenski / slovene

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

Razumevanje in poznavanje osnov informacijskih sistemov.

Prerequisites:

Basic understanding of information systems.

Vsebina:

- Metodološke osnove razvoja informacijskih rešitev in storitev.
- Sodobni pristopi in notacijski standardi za modeliranje in načrtovanje informacijskih rešitev in storitev (npr. UML profili).
- Ogradja procesnih modelov, konvencionalne in agilne metodologije.
- Razvoj na osnovi modelov.
- Produktne linije in tovarne za razvoj programske opreme in informacijskih rešitev.
- Ponovna uporaba na osnovi vzorcev.
- Od programskega do storitvenega inženirstva.
- Storitveno inženirstvo.
- SOA načrtovalski vzorci.
- Vrednotenje kakovosti uporabniških vmesnikov.
- Testiranje in metrike.

Content (Syllabus outline):

- Development of information systems and services – a methodological approach.
- Advanced modeling approaches, techniques and standards (e.g. UML profiles).
- Process frameworks, conventional and agile methodologies
- Model driven development.
- Software Product Lines and Software Factories.
- Software patterns.
- From software to service engineering.
- Service engineering.
- SOA design patterns.
- Evaluation of User Interfaces
- Testing and metrics.

Temeljni literatura in viri / Readings:

- I. Sommerville, *Software Engineering*, 9th Ed, Pearson, 2011.
- M. Bell: *Service-Oriented Modeling, Service Analysis, Design and Architecture*, John Wiley & Sons, Hoboken, NJ, 2008.
- Aspect-Oriented, Model-Driven Software Product Lines, The AMPLE Way, Edited by: Awais Rashid, Jean-Claude Royer, Andreas Rummler, 2011.
- P. Clements and L. Northrop, *Software Product Lines : Practices and Patterns*, Addison-Wesley, 2001
- William E. Lewis, *Software Testing and Continuous Quality Improvement*, Third Edition, Taylor&Francis Group, Auerbach Publications, 2009. K. Schwaber and J. Sutherland: *Software in 30 Days: How Agile Managers Beat the Odds, Delight Their Customers, And Leave Competitors In the Dust*, Wiley, 2012.
- M. Cohn: *Succeeding with Agile: Software Development Using Scrum*, Addison-Wesley Professional, 2009.
- T. Erl: *SOA Design Patterns*, Prentice Hall, New York, 2009.

Cilji in kompetence:

Cilj predmeta je, da študentje razumejo značilnosti sodobnih pristopov k razvoju informacijskih rešitev in storitev ter se usposobijo za vzpostavitev in operacionalizacijo storitvene paradigme. Na osnovi seznanitve z različnimi metodološkimi pristopi bo študent sposoben izbrati, prilagoditi in uporabiti primerna procesna ogradja kot tudi pripadajoče notacijske

Objectives and competences:

The objective of the course is to understand characteristics of advanced approaches to development of information systems and services in order to establish open service-based architectures and solutions. Students will be able to select, define and use appropriate process models and corresponding graphical notations and

tehnike.

diagramming techniques.

Predvideni študijski rezultati:

Znanje in razumevanje:

Po zaključku tega predmeta bo študent sposoben

- izkazati znanje in razumevanje pomena metodološkega pristopa k razvoju informacijskih rešitev in storitev,
- z uporabo principov storitvenega inženirstva razviti poslovne storitve in rešitve,
- razvijati nove rešitve na osnovi načel ponovne uporabe,
- uporabiti sodobna okolja in programska orodja pri načrtovanju, razvoju, uporabi in upravljanju informacijskih rešitev in storitev,
- testirati in vrednotiti kakovost informacijskih rešitev in poslovnih storitev.

Prenosljive/ključne spretnosti in drugi atributi:

- Spretnosti komuniciranja: komuniciranje z vsemi akterji v sklopu storitvenega inženirstva
- Uporaba informacijske tehnologije: uporaba sodobnih modelirnih ter integriranih razvojnih okolij.
- Organizacijske spretnosti: organizacija vlog in porazdelitev dela v skupini.
- Delo v skupini: sodelovanje v projektni skupini za razvoj informacijske in/ali poslovne storitve.

Metode poučevanja in učenja:

- Predavanja,
- sprotne izgradnje in obravnava primerov,
- laboratorijske vaje.

Načini ocenjevanja:

Intended learning outcomes:

Knowledge and understanding:

On completion of this course the student will be able to

- understand the importance and characteristics of different IS development methodologies, techniques and approaches,
- apply service engineering principles to develop enterprise services and solutions,
- develop new solutions using different reuse techniques,
- use advanced tools and environments in design, development, deployment and management of information systems and enterprise services,
- test and evaluate software and enterprise service quality.

Transferable/Key Skills and other attributes:

- Communication skills: in with all actors involved in service engineering.
- Use of information technology: use of advanced modelling and development tools and integrated environments.
- Organisation skills: definition of roles and distribution of work.
- Working in a group: as a member of IS and/or service development project team.

Learning and teaching methods:

- Lectures,
- case building and case studies,
- lab work.

Delež
(v %) /

Weight

Assessment:

(in %)

<ul style="list-style-type: none">• ustni izpit,• laboratorijske vaje,• pisni izpit.	30 % 40 % 30 %	<ul style="list-style-type: none">• oral exam,• lab work,• written exam.
--	----------------------	--

Reference nosilca / Lecturer's references:

- KRAJNC, Andrej, HERIČKO, Marjan, GERLEC, Črt, GOLJAT, Uroš, POLANČIČ, Gregor. Experimental investigation of the quality and productivity of software factories based development. *Comput. Sci. Inf. Syst.*, 2012, vol. 9, iss. 2, str. 667-689,
- POLANČIČ, Gregor, JOŠT, Gregor, HERIČKO, Marjan. An experimental investigation comparing individual and collaborative work productivity when using desktop and cloud modeling tools. *Empirical software engineering*, Sep. 2013, str. 1-34
- RADJENOVIĆ, Danijel, HERIČKO, Marjan, TORKAR, Richard, ŽIVKOVIČ, Aleš. Software fault prediction metrics : a systematic literature review. *Information and software technology*, 2013, vol. 55, iss. 8, str. 1397-1418
- PAVLIČ, Luka, PODGORELEC, Vili, HERIČKO, Marjan. A question-based design pattern advisement approach. *Computer Science and Information Systems*, 2014, vol. 11, no. 2, str. 645-664
- LUKMAN, Tomaž, GODENA, Giovanni, GRAY, Jeffrey G., HERIČKO, Marjan, STRMČNIK, Stanko. Model-driven engineering of process control software beyond device-centric abstractions. *Control eng. pract.* 2013, vol. 21, no. 8, str. 1078-1096