

1.	Course	E-Services Application (Development of Software as a Service)			
2.	Code	INF-S19			
3.	Study programme	Informatics			
4.	Study programme organized by	Faculty of Computer Science and Engineering			
5.	Cycle	Third - PhD			
6.	Academic year / semester winter/summer/elective	first/second	7.	ECTS credits	7.5
8.	Teacher	Prof. D-r Marjan Gusev, Ass. Prof. D-r Sasko Ristov			
9.	Prerequisites	None			
10.	<p>Course programme goals (competences):</p> <p>Service-oriented architectures (SOA) enable the implementation of e-services. This is a big contrast to the monolithic software architecture that opens the possibility of re-usable, flexible, scalable and cost-effective solutions.</p> <p>The technologies of Web services, which currently in general use Web-based protocols, allow wide interoperability capabilities of the systems over Internet.</p> <p>With the emergence of the concept of Cloud, more often the software is offered as a service. The goal of this course is to provide students with knowledge about the principles of e-services and SOA and how they can be applied to deliver business services. Practical skills are related to technology and standards for Web services in Cloud. Also, this course will enable students to develop a long-term software and use of highly effective techniques for developing software as a service (SaaS). Students will be introduced to new challenges and opportunities of SaaS.</p>				
11.	<p>Course syllabus:</p> <p>Basic concepts of public Cloud. SaaS. Basic programming techniques for the design, development and testing of SaaS applications and their deployment in public Cloud. API programming to connect with commercial Clouds such as Amazon, Google or Microsoft. RESTful Web services and messaging and workflow services based on Cloud. Migration of existing applications to Cloud. Load Balancing, caching, distributed transactions, identity management, authorization and encryption.</p>				
12.	<p>Teaching methods:</p> <p>Classes supported with slide presentations, interactive teaching, lab equipment and other software packages, teamwork, case studies, invited guest lecturers, presentations of project works, e-learning materials, forums and consultations</p>				
13.	Total fund of work hours	7,5 ECTS x 30 h = 225 h			
14.	Available hours distribution	45+30+150 = 225			
15.	Teaching activities	15.1.	Theoretical classes	45 h	
		15.2.	Practical classes (labs, exercises), seminars, team work	30 h	
16.	Other activities	16.1.	Project tasks	50 h	

		16.2.	Self study	50 h
		16.3.	Homework	50 h
17.	Grading			
	17.1.	Tests		40 points
	17.2.	Seminar work/ project (presentation: written and oral)		50 points
	17.3.	Active participation		10 points
18.	Grading criteria (points/grade)		to 59 points	5 (five) (F)
			from 60 to 68 points	6 (six) (E)
			from 69 to 76 points	7 (seven) (D)
			from 77 to 84 points	8 (eight) (C)
			from 85 to 92 points	9 (nine) (B)
			from 93 to 100 points	10 (ten) (A)
19.	Conditions for attending the final exam		Successful completion of activities 15.1 and 15.2	
20.	Language		Macedonian or English	
21.	Quality assessment		Internal evaluation and student pools	

22.	Literature				
22.1.	Compulsory				
	No.	Author	Title	Publisher	Year
	1.	David Patterson, Armando Fox	Engineering Long-Lasting Software: An Agile Approach Using SaaS and Cloud Computing, Beta Edition	Strawberry Canyon LLC	2012
	2.	Toby Velte, Anthony Velte, Robert Elsenpeter	Cloud Computing, A Practical Approach	McGraw-Hill	2010
	3.				
	22.2.	Additional			
No.		Author	Title	Publisher	Year
1.					
2.					
3.					