1.	Course	*Advanced Cloud Computing Techniques*		
2.	Code	KNI_E33		
3.	Study programme	Computer Science and Engineering PhD study programme		
4.	Study programme organized by	FCSE		
5.	Cycle	Third – PhD		
6.	Academic year / semester winter/summer/elective	7. ECTS credits 7,5		
8.	Teacher	Prof. d-r Igor Mishkovski, Prof . d-r Sonja Filiposka		
9.	Prerequisites	None		
10.	Course programme goals (competences): The students will be able to create sustainable cloud software applications. The students will be able to design, implement and manage advanced cloud software applications. They will be able to identify, evaluate and implement cloud resource access via a mobile terminal, as well as identify and access the advanced cloud computing architectures implemented by commercial companies.			
11.	Course syllabus: Advanced cloud computing and virtualization techniques. State-of-the-art approaches and solutions for design, building and sustainability of advanced cloud applications. Cloud architecture and anything-as-a-service XaaS models. Critical programming models. Advanced resource virtualization techniques (computing, storage, network). Machine virtualization, critical implementation techniques and benefits. XEN internal architecture: domains, CPU sharing, HyperCall, memory sharing, input/output sharing. Requests and limitations of the advanced cloud computing architectures. Cloud software solutions QoS. Advanced cloud computing architecture and sophisticated industrial systems. Cloud infrastructure and applications. Cloud mobile applications. Control identification and security risks in the cloud. Innovative risk management solutions for cloud computing. Advanced cloud security and privacy.			
12.	Teaching methods: 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.			
13.	Total fund of work hours	7,5 EKTC 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.	William J. Buchanan	Advanced Cloud Computing and Virtualization	Auerbach Publications	2013
		2.	Matthew Portnoy	Virtualization Essentials	John Wiley & Sons	2012
		3.	Massimo Cafaro and Giovanni Aloisio	Grids, Clouds and Virtualization	Springer	2011
	22.2.	Additional			
		No.	Author	Title	Publisher	Year
		1.				
		2.				
		3.				