1.	Course title	**Network Visualization and Cloud Computing**		
2.	Course code	KMET-I-17		
3.	Study program	**Computer networks and e-technologies**		
4.	Unit offering the course	**FCSE**		
5.	Undergraduate/master/PhD	**Master**		
6.	Year/semester 1(2)/summer/elective	7. ECTS: **6**		
8.	Teacher(s)	Assist. Prof. Igor Mishkovski		
9.	Course prerequisites	None		
10.	Goals (competences): After successfully completing the course, the student is expected to understand the new technologies of network virtualization and cloud computing, their principles, modelling, analysis, design and possible industrial applications. The student will be able to develop applications and enable services that are active on a distributed network using virtual resources.			
11.	Course content: Virtualization concepts, components and infrastructure. Virtualization on the infrastructure level. Hardware and software virtualization. CPU virtualization. Storage virtualization. SAN, ISCSI. Network virtualization. VLAN. Virtual machine life cycle management. Virtualization services. Cloud computing concepts, evolution, architectures, infrastructure, possibilities, risk, company adaptation strategies, standards and policies. Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS), Infrastructure-as-a-Service (IaaS). Modern cloud computing technologies and tools. Cloud computing security. Real scenarios and team projects. Azure platform: introduction to cloud services, Azure platform overview, Azure storage, Azure application factory, SQL Azure. Amazon EC2, Amazon S3, Amazon DB, Queues and Cloud Front. Big data. MapReduce.			
12.	Teaching methods: Lectures supported by slide presentations, interactive lectures, trainings (using lab equipment and software packages), team work, case studies, invited guests and lectures, individual practical assignments presentations, seminar paper, e-learning (forums, consultations).			
13.	Total available time	6 ECTS x 30 hours = 180 hours		
14.	Distribution of the available time	30 + 15 + 135 = 180 hours		
15.	Teaching activities	15.1.	Lectures	30 hours
		15.2.	Training (labs, problem solving), seminar and team work	15 hours
16.	Other activities	16.1.	Project work	60 hours
		16.2.	Self study	25 hours
		16.3.	Home work	50 hours
17.	Grading			
	17.1.	Tests		40 points
	17.2.	Seminar work/project (written or oral presentation)		45 points
	17.3.	Active participation		15 points

18.	Grading criteria	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.	Final exam prerequisites	Successfully completed activities 15.1 and 15.2	
20.	Course language	Macedonian and English	
21.	Quality assurance methods	Internal evaluation and student questionnaires	

22. Literature

22.1. Compulsory

No.	Authors	Title	Publisher	Year
1.	Ivana Menken, Gerard Blokdijk	Cloud Computing Virtualization Specialist Complete Certification Kit	Emereo Publishing	2009
2.	Chris Wolf, Erick M. Halter	Virtualization: From the Desktop to the Enterprise	Apress	2005
3.	Venkata Josyula, Malcolm Orr, Greg Page	Cloud Computing: Automating the Virtualized Data Center (Networking Technology)	Cisco Press	2011

22.2. Additional

No.	Authors	Title	Publisher	Year
1.	Tejaswi Redkar	Windows Azure Platform	Apress	2009
2.		Selected papers		
3.				