1.	Course title	**Computer networks monitoring and performances**
2.	Course code	KMET-I-10
3.	Study program	**Computer networks and e-technologies**
4.	Unit offering the course	**FCSE**
5.	Undergraduate/master/PhD	**Master**
6.	Year/semester 1(2)/winter/elective	7. ECTS: **6**
8.	Teacher(s)	Assist. Prof. Sonja Filiposka
9.	Course prerequisites	None

10.	Goals (competences): After successfully completing the course, the student is expected to understand and be able to use the methods and tools for network management.
11.	Course content: The need for and tasks of network management. ISO standard Network Management Architecture. Programming control of QoS. Using standard network protocol, shared resources management. Performance management: network delay and capacity, flow assignments. Management software for control of networking devices. Security and firewalling. Passwords and access control mechanisms. Domain management. Network management using standard protocols like SNMP. Virtual network management and OpenFlow like architectures. Popular tools like: HP Open View, Cisco Visual Switch Manager, Computer Associates - Network and System Management.
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		45 points
	17.2.	Seminar work/project (written or oral presentation)		45 points
	17.3.	Active participation		10 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.	Michael W. Lucas	Network Flow Analysis	No Starch Press	2010
		2.	Benoit Claise, Ralf Wolter	Network Management: Accounting and Performance Strategies	Cisco Press	2007
		3.	Neal Allen	Network Maintenance and Troubleshooting Guide: Field Tested Solutions for Everyday Problems (2nd Edition)	Addison-Wesley Professional; 2 edition	2009
	22.2.	Additional				
		No.	Authors	Title	Publisher	Year
		1.	Alexander Clemm	Network Management Fundamentals	Cisco Press	2006
		2.				
		3.				