1.	Course title	**Modern network analysis methods**		
2.	Course code	KMET-Z-01		
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/compulsory	7. ECTS: **6**		
8.	Teacher(s)	Prof. Ljupco Kocarev		
9.	Course prerequisites	None		
10.	Goals (competences): After successfully completing the course, the student is expected to understand the modern methods and concepts for network analysis. The students will posses the know-how to apply optimization methods and maximisation of the usability functions.			
11.	Course content: Processes that occur on networks, virus spreading. Network analysis (min-plus algebra applied in queuing systems for computer/communication networks). Stochastic network analysis. Example: analysing the TCP/IP protocol suite. Different elements of the optimization theory applied in networking. Maximisation of the network usability functions. Applying game theory in networking problems. Network coding. Random networks. Example: defining the capacity of wireless networks.			
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.	Louis G. Birta, Gilbert Arbez	Modelling and Simulation: Exploring Dynamic System Behaviour	Springer	2007
		2.	Mark Newman	Networks: An Introduction	Oxford University Press	2010
		3.	David Easley and Jon Kleinberg	Networks, Crowds, and Markets: Reasoning About a Highly Connected World	Cambridge University Press	2010
	22.2.	Additional				
		No.	Authors	Title	Publisher	Year
		1.				
		2.				
		3.				