1.	Course title	Visualization		
2.	Course code			
3.	Study program	FCSE		
4.	Unit offering the course	**FCSE**		
5.	Undergraduate/postgraduate/PhD	**Undergraduate**		
6.	Year/semester	7. ECTS: **6**		
8.	Teacher(s)	Prof. dr. Suzana Loshkovska, assist. prof. dr. Ivica Dimitrovski		
9.	Course prerequisites	Object-oriented programming		
10.	Goals (competences): This course should provide students with an introduction to the concept of data visualization, selection of techniques and algorithms for the visualization of different data sets, techniques for mapping data in graphical primitives and their program implementation. Upon completion of the course the student is expected to demonstrate knowledge of the data visualization concept, to know how to choose and implement algorithms for visualizing different data types by programming or by using visualization tools.			
11.	Course content: Introduction. Definitions and terminology. Data and data representation. Visualization pipeline. Scalar visualization. Scalar visualization by colour, selection and implementation of colour palettes. Iso-contours and iso-surfaces. Volume visualization. Vector visualization (icons, stream lines, stream tubes). Information visualization. Multidimensional data visualization. Animation and interaction.			
12.	Teaching methods: lectures with presentations, interactive lectures, lab classes, exercises, team work, invited guest lectures, student projects and home works.			
13.	Total available time	6 ECTS X 30h = 180h		
14.	Distribution of the available time	30+15+30+30+15+60=180h		
15.	Teaching activities	15.1.	Lectures	30 hours
		15.2.	Training (labs, problem solving), seminar and team work	45 hours
16.	Other activities	16.1.	Project work	30 hours
		16.2.	Self study	15 hours
		16.3.	Home work	60 hours
17.	Grading			
	17.1.	Tests		80 points
	17.2.	Seminar work/project (written or oral presentation)		15 points

	17.3.	Active participation				5 points
18.	Grading criteria			to 50 points		5 (five) (F)
				from 51 to 60 points		6 (six) (E)
				from 61 to 70 points		7 (seven) (D)
				from 71 to 80 points		8 (eight) (C)
				from 81 to 90 points		9 (nine) (B)
				from 91 to 100 points		10 (ten) (A)
19.	Final exam prerequisites			Realized activities 15.2 and 16.1		
20.	Course language			Macedonian and English		
21.	Quality assurance methods			Internal evaluations and surveys		
22.	Literature					
	22.1.	Compulsory				
		No.	Authors	Title	Publisher	Year
		1.	H. Wright	Introduction to Scientific Visualization	Springer	2007
		2.	A. Telea	Data Visualization: Principles and Pracitce	A K Peters Ltd.	2008
		3.				
	22.2.	Mandatory				
		No.	Authors	Title	Publisher	Year
		1.	R. Spence	Information Visualization, Design for Interaction	Prentice Hall	2007
		2.				
		3.				