

1.	Course Title	Visualization		
2.	Code	F18L3W081		
3.	Study program	Software engineering and information systems		
4.	Study Program Organizer	Faculty of Computer Science and Engineering		
5.	Degree (first, second, third cycle)	first cycle		
6.	Academic year / semester 3 / winter / mandatory	7. ECTS credits 6		
8.	Teacher	full professor Suzana Loshkovska		
9.	Course enrollment prerequisites	Алгоритми и податочни структури		
10.	<p>Course program goals (competencies):</p> <p>The aim of the course is to familiarize students with the concept of data visualization, selection of techniques and algorithms for visualization of different data sets, and their program implementation. Upon completion of the course is expected the student to demonstrate knowledge of the concept of data visualization, knowledge how to select and implement algorithms for visualizing different data types by programming or by using visualization tools.</p>			
11.	<p>Course program content:</p> <p>Introduction. Definitions and terminology. Data and representation of data. Visualization pipeline. Visualization of scalars. Mapping algorithms for scalar values. Isolines and isosurfaces. Visualization of volume data. Visualization of vectors. Icons for vector visualization. Visualization of streams and flows. Information visualization. Visualization of multidimensional data. Visualization of relations. Visualization animation. Interaction techniques in the process of visualization.</p>			
12.	<p>Learning methods:</p> <p>Lectures using presentations, interactive lectures, exercises (using equipment and software packages), teamwork, case studies, invited guest lecturers, independent preparation and defense of a project assignment and seminar work.</p>			
13.	Total available time	6 ECTS x 30 hours = 180 hours		
14.	Distribution of the available time	30 + 45 + 15 + 15 + 75 = 180 hours		
15.	Teaching activity forms	15.1.	Lectures – theoretical teaching	30 hours

		15.2.	Exercises (laboratory, auditory), seminar papers, teamwork	45 hours		
16.	Other activity forms	16.1.	Project Tasks	15 hours		
		16.2.	Independent Learning Tasks	15 hours		
		16.3.	Home learning	75 hours		
17.	Assessment methodology					
	17.1.	Tests		0 points		
	17.2.	Seminar paper/project (presentation: written and oral)		20 points		
	17.3.	Activity and learning		10 points		
	17.4.	Final exam		70 points		
18.	Assessment criteria (points/grade)	up to 50 points		5 (five) (F)		
		51 to 60 points		6 (six) (E)		
		61 to 70 points		7 (seven) (D)		
		71 to 80 points		8 (eight) (C)		
		81 to 90 points		9 (nine) (B)		
		91 to 100 points		10 (ten) (A)		
19.	Course completion and final exam requirements	Realized activities 15.1 and 15.2				
20.	Teaching Language	Macedonian and English				
21.	Teaching quality evaluation method	Internal evaluation mechanisms and questionnaires				
22.	Course Material					
	22.1.	Mandatory course material				
		No	Author	Title	Publisher	Year
		1	Andy Kirk	Data Visualization: a successful design process	Packt Publishing Ltd.	2012
		2	Alexandru C. Telea	Data Visualization: Principles and Practice, Second Edition	A K Peters/CRC Press	2014
		3	by Matthew O. Ward, Georges Grinstein, Daniel Keim	Interactive Data Visualization: Foundations, Techniques, and Applications, Second Edition	A K Peters/CRC Press	2015
	22.2.	Additional course material				

No.	Author	Title	Publisher	Year