1.	Course title	**Content based indexing and retrieval**		
2.	Course code			
3.	Study program	**Master studies of Information Science and Computer Engineering - Content-Based Search and Retrieval**		
4.	Unit offering the course	**FCSE**		
5.	Undergraduate/master/PhD	**Master**		
6.	Year/semester 1/winter/compulsory	7. ECTS: **6**		
8.	Teacher(s)	assist. prof. dr. Ivica Dimitrovski / prof. dr. Sonja Gievska		
9.	Course prerequisites	None		
10.	Goals (competences): The student will be able to design and implement algorithms for extracting descriptors for different types of data (such as text, images, audio and video); their integration in descriptors languages; designing algorithms for comparing descriptors, and thus implementation of schemes for data indexing and retrieval.			
11.	Course content: Algorithms for extracting/generating descriptors of text, images, audio and video data. Visual characteristics of image: colour, texture, shape. Detecting key frames and scenes in video sequences. Reducing the dimensionality of the descriptors. Algorithms and metrics for comparing descriptors. Linear search. Approximate *k* nearest neighbours. Methods for indexing and retrieval based on tree structures. Adjustment of descriptors by using descriptors schemes (annotations), Syntax and semantic integration in description languages (ontologies) of high level. Semantic based search.			
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	130 + 0 + 50 = 180 hours		
15.	Teaching activities	15.1.	Lectures	130 hours
		15.2.	Training (labs, problem solving), seminar and team work	0 hours
16.	Other activities	16.1.	Project work	15 hours
		16.2.	Self study	15 hours
		16.3.	Home work	20 hours
17.	Grading			
	17.1.	Tests		65 points
	17.2.	Seminar work/project (written or oral presentation)		25 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.	Vittorio Castelli	Multidimensional Indexing Structures for Content-based Retrieval	IBM Research	2001
		2.	J. Philbin	Scalable Object Retrieval in Very Large Image Collections	University of Oxford	2010
		3.	David G. Lowe	Distinctive image features from scale-invariant key points	International Journal of Computer Vision	2004
	22.2.	Additional				
		No.	Authors	Title	Publisher	Year
		1.				
		2.				
		3.				