

1.	Course title	<b>Advanced databases</b>		
2.	Course code	CSES620		
3.	Study program	CSE, ET, ASI		
4.	Unit offering the course	<b>FCSE</b>		
5.	Undergraduate/postgraduate/PhD	<b>Undergraduate</b>		
6.	Year/semester: 3/summer/elective	7. ECTS: <b>6</b>		
8.	Teacher(s)	Prof. DancoDavcev, Prof. Margita Kon-Popovska, Assoc. Prof. Andrea Kulakov, Assoc. Prof. Slobodan Kalajdziski, Assist. Prof. GoranVelinov		
9.	Course prerequisites	Databases		
10.	Goals (competences): The goal of the course is to introduce the students with the advanced concepts of relational database systems, data modelling, management and maintenance, as well as the development of data centric information systems. Also, the students will acquire strong theoretical and practical knowledge about the novel features and extensions of the relational and non-relational database systems, as well as the contemporary issues in the database systems development.			
11.	Course content: Advanced data modelling – standards, model types and patterns; Detailed architecture of the database management systems, database security and recovery; Query execution and optimization data indexing, partitioning and clustering; Parallel and distributed database systems, replication; Transactional and analytical database systems, Object-oriented and object-relational databases, object - relational mapping; Web oriented and mobile systems and databases; Practical implementation of advanced data modelling techniques and tools, database administration and database performance management; Tools for replication and recovery; Advanced SQL; Database programming.			
12.	Teaching methods: Lectures supported by presentations with slides, interactive lectures, exercises invited guest lecturers, preparation and defence of a project work and seminar thesis, learning in an e-environment (forums, consultations).			
13.	Total available time	6 ECTS x 30 h = 180 h		
14.	Distribution of the available time	30 + 60 + 50 + 40 = 180 h		
15.	Teaching activities	15.1.	Lectures	30 hours
		15.2.	Training (labs, problem solving), seminar and team work	60hours
16.	Other activities	16.1.	Project work	50hours
		16.2.	Self study	40hours
		16.3.	Home work	
17.	<b>Grading</b>			
	17.1.	Tests		70points
	17.2.	Seminar work/project (written or oral presentation)		20points

	17.3.	Active participation			10 points	
18.	Grading criteria	to50points			5 (five) (F)	
		from51to 60points			6 (six) (E)	
		from61to70points			7 (seven) (D)	
		from71to80points			8 (eight) (C)	
		from81to90points			9 (nine) (B)	
		from91to100points			10 (ten) (A)	
19.	Final exam prerequisites			completed activities 15 and 16		
20.	Course language			Macedonian and English		
21.	Quality assurance methods			Internal evaluation and satisfaction polls		
22.	Literature					
	22.1.	Compulsory				
		No.	Authors	Title	Publisher	Year
		1.	Abraham Silberschatz, Henry Korth , S. Sudarshan	Database System Concepts	Sixth Edition, McGraw-Hill	2010
		2.	R. Elmasri, S. Navathe	Fundamentals of Database Systems	Addison Wesley (6th Edition)	2010
	3.	Thomas M. Connolly and Carolyn E. Begg	Database Systems: A Practical Approach to Design, Implementation and Management	Addison Wesley (5th Edition)	2009	
	22.2.	Optional				
		No.	Authors	Title	Publisher	Year
		1.	M. Tamer Özsu, Patrick Valduriez	Principles of Distributed Database Systems	Springer; 3rd Edition	2011
		2.	A. Moller and M. Schwartzbach	An Introduction to XML and Web Technologies	Addison Wesley	2006
3.	H. Garcia-Molina, J. Ullman, J. Widom	Database Systems: The Complete Book	Prentice Hall (2nd Edition)	2008		