1.	Course title	**Unstructured data architectures and ontologies**		
2.	Course code	SBP-I-01		
3.	Study program	**Content-based retrieval**		
4.	Unit offering the course	**FCSE**		
5.	Undergraduate/master/PhD	**Master**		
6.	Year/semester 1/winter/elective	7. ECTS: **6**		
8.	Teacher(s)	associate professor Andrea Kulakov associate professor Slobodan Kalajdziski		
9.	Course prerequisites	None		
10.	Goals (competences): The student will be trained for modelling databases for non-standard data types, and management and utilization of these type of data.			
11.	Course content: Review of traditional systems of databases based on relational model, object - oriented and object - relational models. SQL3 standard. Contextual-based unstructured data retrieval in terms of database. Types of questions to test the similarity. Indexing schemes for unstructured data (R-trees, X-trees, M-trees). Systems for data-management in text database systems for data management in multimedia databases, management systems of bioinformatics databases. Advanced concepts for data management: hashing and multi-key access methods, data in main memory and disk data. Advanced algorithms for data management, learning and knowledge discovery in databases for unstructured data. Addressing the problems of feature selection of the data, multidimensional indexing, interactive search and retrieval, detection of schemes of recurrence and scalability. Syntax, structure and semantics. Understanding the contents: meta-data standards, XML + meta-data specification, RDF and metadata processing. Ontology, domain-specific modelling, logic, contextual classification and techniques for extracting semantic meta-data (statistical, statistical learning / AI, lexical and natural language, knowledge-based). Review of existing ontologies developed for different domains.			
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

Compulsory

No.	Authors	Title	Publisher	Year
1.	B. Prabhakaran	Multimedia Database Management Systems	Springer; 1 edition	1996
2.	P. Heinckiens	Building Scalable Database Applications: Object-Oriented Design, Architectures, and Implementations	Addison-Wesley Professional	1999
3.	T.Kyte	Expert Oracle Database Architecture: 9i and 10g Programming Techniques and Solutions	Apress; Pap/Cdr edition	2005

Additional

No.	Authors	Title	Publisher	Year
1.	R. Sharman, R. Kishore, R. Ramesh	Ontologies (Integrated Series in Information Systems)	Springer	2006
2.	Y. Kompatsiaris, P. Hobson	Semantic Multimedia and Ontologies: Theory and Applications	Springer	2008
3.	J. Euzenat, P. Shvaiko	Ontology Matching	Springer	2007