SYLLABUS

1. Information regarding the programme

1.1 Higher education institution	**Babeş Bolyai University**
1.2 Faculty	**Faculty of Mathematics and Computer Science**
1.3 Department	**Department of Computer Science**
1.4 Field of study	**Computer Science**
1.5 Study cycle	**Bachelor**
1.6 Study programme / Qualification	**Computer Science**

2. Information regarding the discipline

2.1 Name of the discipline	**Database Management System**						
2.2 Course coordinator	**Lect. PhD Dan Mircea Suciu**						
2.3 Seminar coordinator	**Assist. PhD Sabina Surdu, Assist. PhDCatalin Rusu**						
2.4. Year of study	**2**	2.5 Semester	**1**	2.6. Type of evaluation	**E**	2.7 Type of discipline	**Compulsory**

3. Total estimated time (hours/semester of didactic activities)

3.1 Hours per week	4	Of which: 3.2 course	2	3.3 seminar/laboratory	1/1
3.4 Total hours in the curriculum	56	Of which: 3.5 course	28	3.6 seminar/laboratory	28
Time allotment:					hours
Learning using manual, course support, bibliography, course notes					15
Additional documentation (in libraries, on electronic platforms, field documentation)					10
Preparation for seminars/labs, homework, papers, portfolios and essays					22
Tutorship					3
Evaluations					20
Other activities:					-

3.7 Total individual study hours	70
3.8 Total hours per semester	126
3.9 Number of ECTS credits	6

4. Prerequisites (if necessary)

4.1. curriculum	• Data Structures and Algorithms • Databases Basics
4.2. competencies	Average programming skills in a high level programming language

5. Conditions (if necessary)

5.1. for the course	Video projector
5.2. for the seminar /lab activities	Laboratory with computers with MS SQL Server (minimum 2008)

6. Specific competencies acquired

Professional competencies	C 5.3 Usage of methods and methodologies for database design of specific projects C 5.4 Evaluation quality of different database management systems from structural, functional and extensibility points of view. C 5.5 Development of particular databases projects.
Transversal competencies	CT1 - Apply rules to: organized and efficient work, responsibilities of didactical and scientific activities and creative capitalization of own potential, while respecting principles and rules for professional ethics CT3 - Use efficient methods and techniques for learning, knowledge gaining, and research and develop capabilities for capitalization of knowledge, accommodation to society requirements and communication in English

7. Objectives of the discipline (outcome of the acquired competencies)

7.1 General objective of the discipline	• To get acquainted with the general concepts regarding the databases. • To get acquainted with the data models, especially the relational model.
7.2 Specific objective of the discipline	• To get acquainted with the problems regarding the database security, stored procedures, client-server technology, concurrent access to the databases, database recovery, distributed databases.

8. Content

8.1 Course	Teaching methods	Remarks
1. Transactions. Concurrency control. Execution plan	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
2. Interference anomalies. Serializability	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
3. Concurrency control locking policies: 2PL conservative, 2PL strict.	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
4. Deadlock Management.	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
5. Concurrency control with timestamps. OCC.	• Interactive exposure • Explanation • Conversation • Didactical	

	demonstration	
6. Multi-versioning	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
7. Data recovery.	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
8. Parallel Databases	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
9. Distributed Databases.	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
10. Transaction Management in Distributed Databases.	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
11. Locking Management in Distributed Databases.	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
12. Data Recovery in Distributed Databases.	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
13. Database Security.	• Interactive exposure • Conversation	
14. Data Warehouses	• Interactive exposure • Conversation	

Bibliography

1. AHO, A., HOPCROFT, J., ULLMAN, J., Data Structures and Algorithms. Addison-Wesley, Reading, Massachusetts, 1983.
2. BÂSCA, O., Baze de date. Editura All, Bucuresti 1997.
3. DATE, C.J., An Introduction to Data Base Systems. Addison Wesley, Reading, MA, 2004.

8.2 Seminar / laboratory	Teaching methods	Remarks
1. Transactions in MS SQL Server	Dialogue, debate, case studies, examples, proofs	The seminar is structured as 2 hours classes every second week
2. Concurrency control in MS SQL Server	Dialogue, debate, case studies, examples, proofs	

3. Security in MS SQL Server	Dialogue, debate, case studies, examples, proofs	
4. Query optimization in MS SQL Server	Dialogue, debate, case studies, examples, proofs	
5. Database administration	Dialogue, debate, case studies, examples, proofs	
6. Distributed databases specific statements	Dialogue, debate, case studies, examples, proofs	
7. NoSQL Databases	Dialogue, debate, case studies, examples, proofs	
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Bibliography		

9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

- The course structure is according with the IEEE and ACM Recommendations for Computer Science studies;
- The course is part of the studying program of all major universities in Romania and abroad;
- The content of the course is considered by the software companies as mandatory knowledge for a senior level software developer

10. Evaluation

Type of activity	Evaluation criteria	Evaluation methods	Share in the grade (%)
Course	- know the basic principle of the domain; - apply the course concepts - problem solving	Written exam	50%
Seminar/lab activities	- be able to create an SQL script for tables maintenance - be able to detect optimization problems in SQL queries	- Practical examination - Continuous observations	50%
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Minimum performance standards			
• The final grade (average between written exam and laboratory work) should be at least grade 5 (from a scale of 1 to 10)			

Date	Signature of course coordinator	Signature of seminar coordinator
.....	Lect. PhD. Dan Mircea Suciu	Lect. PhD. Dan Mircea Suciu

Date of approval Signature of the head of department