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	**Databases**						
2.2 Course coordinator	**Lect. PhD Dan Mircea Suciu**						
2.3 Seminar coordinator	**Lect. PhD Dan Mircea Suciu**						
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	5	Of which: 3.2 course	2	3.3 seminar/laboratory	1/2
3.4 Total hours in the curriculum	70	Of which: 3.5 course	28	3.6 seminar/laboratory	14/21
Time allotment:					hours
Learning using manual, course support, bibliography, course notes					20
Additional documentation (in libraries, on electronic platforms, field documentation)					10
Preparation for seminars/labs, homework, papers, portfolios and essays					29
Tutorship					5
Evaluations					20
Other activities:					-

3.7 Total individual study hours	84
3.8 Total hours per semester	154
3.9 Number of ECTS credits	6

4. Prerequisites (if necessary)

4.1. curriculum	Data Structures and Algorithms
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 2005) installed.

6. Specific competencies acquired

Professional competencies	C 5.1 Identification of basic concepts for database organization C 5.2 Identification and explanation of basic models for data management in databases C 5.3 Usage of methods and methodologies for database design of specific 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 data bases. • To get acquainted with the data models, especially the relational model.
7.2 Specific objective of the discipline	• To be able to create and modify databases in MS SQLServer • Ability to manage databases in .Net

8. Content

8.1 Course	Teaching methods	Remarks
1. Introduction in Databases	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
2. Relational Databases	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
3. SQL Queries	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
4. Relational Algebra	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
5. Schema Refinement	• Interactive exposure • Explanation • Conversation • Didactical demonstration	

6. Normal Forms	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
7. Entity-Relational Model	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
8. Database design	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
9. Physical structure of DBs	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
10. Indexes	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
11. Trees	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
12. Hash-Files	• Interactive exposure • Explanation • Conversation • Didactical demonstration	
13. Object-Oriented Databases	• Interactive exposure • Conversation	
14. Object-Relational Databases	• 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	Teaching methods	Remarks
1. CRUD statements in SQL	Dialogue, debate, case studies, examples, proofs	The seminar is structured as 2 hours classes every second week
2. Data Definition specific statements in SQL	Dialogue, debate, case studies, examples, proofs	
3. Cursors	Dialogue, debate, case	

	studies, examples, proofs	
4. Design databases.	Dialogue, debate, case studies, examples, proofs	
5. Normal forms in practice	Dialogue, debate, case studies, examples, proofs	
6. Advance clauses in SELECT statements	Dialogue, debate, case studies, examples, proofs	
7. Indexes in MS SQL Server	Dialogue, debate, case studies, examples, proofs	
	•	
	•	

Bibliography

1. KORTH, H.F., SILBERSCHATZ, A., Data Base System Concepts. McGraw-Hill Book Compagny, 1986.
2. LIVIU NEGRESCU, LAVINIA NEGRESCU, Limbajul C# pentru incepatori. Editura Albastra, Cluj-Napoca 2011.
3. RAMAKRISHNAN, R., Database Management Systems. McGraw-Hill, 1998.

8.3 Laboratory	Teaching methods	Remarks
1. + 2. Create a database in MS SQL Server with at least 10 tables, and fill 5 of its tables with at least 10 relevant records	Explanation, dialogue, case studies	
3. +4. + 5. Create SQL scripts for versioning and to change database structure	Explanation, dialogue, case studies	
6.+7.+8. Develop 10 complex SQL queries according with some specific criteria.	Explanation, dialogue, case studies	
9.+10.+11. Develop testing scripts to analyse the efficiency of a database	Explanation, dialogue, case studies	
12. +13.+14. SQL queries optimization	Testing data discussion, evaluation	

Bibliography

1. KORTH, H.F., SILBERSCHATZ, A., Data Base System Concepts. McGraw-Hill Book Compagny, 1986.
2. LIVIU NEGRESCU, LAVINIA NEGRESCU, Limbajul C# pentru incepatori. Editura Albastra, Cluj-Napoca 2011.
3. RAMAKRISHNAN, R., Database Management Systems. McGraw-Hill, 1998.
4. T. THEMSTROM, A. WEBBER, M. HOTEK, MS SQL Server 2008 - Database Development, Self Paced Training Kit 2009

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 software developer

10. Evaluation

Type of activity	Evaluation criteria	Evaluation methods	Share in the grade (%)
Course	- know the basic principle of the domain;	Written exam	50%

	- apply the course concepts - problem solving		
Seminar/lab activities	- be able to create and maintenance a database - apply the course concepts to develop simple to complex SQL queries	- Practical examination - Continuous observations	50%
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