

FIȘA DISCIPLINEI

1. Information regarding the programme

1.1 Higher education institution	Babeș 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 sem + 2 lab
3.4 Total hours in the curriculum	70	Of which: 3.5 course	28	3.6 seminar/laboratory	42
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	25				
Tutorship	5				
Evaluations	20				
Other activities:	-				
3.7 Total individual study hours	80				
3.8 Total hours per semester	150				
3.9 Number of ECTS credits	6				

4. Prerequisites (if necessary)

4.1. curriculum	<ul style="list-style-type: none"> Data Structures and Algorithms
4.2. competencies	<ul style="list-style-type: none"> Average programming skills in a high level programming language

5. Conditions (if necessary)

5.1. for the course	<ul style="list-style-type: none">
5.2. for the seminar /lab activities	<ul style="list-style-type: none"> Laboratory with computers with MS SQL Server (minimum 2005) installed.

6. Specific competencies acquired

Professional competencies	<ul style="list-style-type: none"> - Knowledge, understanding and use of basic concepts of theoretical Computer Science - Ability to work independently and/or in a team in order to solve problems in defined professional contexts. - Good database design and programming skills
Transversal competencies	<ul style="list-style-type: none"> - Ability to create SQL queries to different real life situations - Ability to create databases using SQL statements - Improved programming abilities

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

7.1 General objective of the discipline	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	Exposure: description, explanation, examples, discussion of case studies	
2. Relational Databases	Exposure: description, explanation, examples, discussion of case studies	
3. SQL Queries	Exposure: description, explanation, examples, debate, dialogue	
4. Relational Algebra	Exposure: description, explanation, examples, discussion of case studies	
5. Schema Refinement	Exposure: description, explanation, examples, discussion of case studies	
6. Normal Forms	Exposure: description, explanation, examples, discussion of case studies	
7. Entity-Relational Model	Exposure: description, explanation, examples, discussion of case studies	
8. Database design	Exposure: description, explanation, examples, discussion of case studies	
9. Physical structure of DBs	Exposure: description,	

	explanation, examples, discussion of case studies	
10. Indexes	Exposure: description, explanation, examples, debate, dialogue	
11. Trees	Exposure: description, explanation, examples, debate, dialogue	
12. Hash-Files	Exposure: description, explanation, examples, debate, dialogue	
13. Object-Oriented Databases	Exposure: description, explanation, examples, debate, dialogue	
14. Object-Relational Databases	Exposure: description, explanation, examples, debate, dialogue	

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. ADO.NET library	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. SQL optimization	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. Design and develop a .NET application which maintains the content of a table	Explanation, dialogue, case studies	
6.+7.+8. High level operations developed in C# for maintaining an n-to-m relationship between two tables.	Explanation, dialogue, case studies	

9.+10.+11. Develop 10 complex SQL queries according with some specific criteria.	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

<ul style="list-style-type: none"> • 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	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.4 Course	- know the basic principle of the domain; - apply the course concepts - problem solving	Written exam	50%
10.5 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%
10.6 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

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Signature of course coordinator

Lect. PhD. Dan Mircea Suci

Signature of seminar coordinator

Lect. PhD. Dan Mircea Suci

Date of approval

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Signature of the head of department

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