

SYLLABUS

1. Data about the program of study

1.1 Institution	The Technical University of Cluj-Napoca
1.2 Faculty	Faculty of Automation and Computer Science
1.3 Department	Computer Science
1.4 Field of study	Computer Science and Information Technology
1.5 Cycle of study	Bachelor of Science
1.6 Program of study/Qualification	Computer science/ Engineer
1.7 Form of education	Full time
1.8 Subject code	19.

2. Data about the subject

2.1 Subject name	DataBase				
2.2 Course responsible/lecturer	S.I. dr. eng. Călin Cenan – Calin.Cenan@cs.utcluj.ro				
2.3 Teachers in charge of seminars/ laboratory/ project	Conf. dr. eng. Delia Mitrea – Delia.Mitrea@cs.utcluj.ro				
2.4 Year of study	II	2.5 Semester	1	2.6 Type of assessment (E - exam, C - colloquium, V - verification)	E
2.7 Subject category	DF – fundamentală, DD – în domeniu, DS – de specialitate, DC – complementară				DD
	DI – Impusă, DOp – opțională, DFac – facultativă				DI

3. Estimated total time

3.1 Number of hours per week	4	of which:	Course	2	Seminars		Laboratory	2	Project	
3.2 Number of hours per semester	56	of which:	Course	28	Seminars		Laboratory	28	Project	
3.3 Individual study:										
(a) Manual, lecture material and notes, bibliography										11
(b) Supplementary study in the library, online and in the field										18
(c) Preparation for seminars/laboratory works, homework, reports, portfolios, essays										11
(d) Tutoring										1
(e) Exams and tests										3
(f) Other activities:										
3.4 Total hours of individual study (suma (3.3(a)...3.3(f)))					44					
3.5 Total hours per semester (3.2+3.4)					100					
3.6 Number of credit points					4					

4. Pre-requisites (where appropriate)

4.1 Curriculum	Mathematics
4.2 Competence	Set theory

5. Requirements (where appropriate)

5.1. For the course	Board, video projector, computer; student present in mandatory 50% of days for admission to the final exam
5.2. For the applications	Computers, specific software; student present in mandatory 100% of days for admission to the final exam

6. Specific competence

6.1 Professional competences	<p>C4 - Improving the performances of the hardware, software and communication systems</p> <p>C4.1 - Identifying and describing the defining elements of the performances of the hardware, software and communication systems</p> <p>C4.2 - Explaining the interaction of the factors that determine the performances of the hardware, software and communication systems</p>
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	<p>C4.3 - Applying the fundamental methods and principles for increasing the performances of the hardware, software and communication systems</p> <p>C4.4 - Choosing the criteria and evaluation methods of the performances of the hardware, software and communication systems</p> <p>C4.5 - Developing professional solutions for hardware, software and communication systems based on performance optimization</p>
6.2 Cross competences	N/A

7. Discipline objective (as results from the key competences gained)

7.1 General objective	Developing general skills in databases and database applications
7.2 Specific objectives	<p>Assimilate theoretical knowledge on relational databases, Structured Query Language SQL language</p> <p>Presentation of Database Management Systems DBMS</p> <p>Getting practical skills for designing and implementing database and development of database application</p>

8. Contents

8.1 Lectures	Hours	Teaching methods	Notes
Introduction. Database, Database Management Systems	2	PDF & PPT Presentations; Demonstrations and model presentations on board; small exercises to increase interaction	
Database Management Systems Architecture	2		
Entity – Relation Model	2		
Relational Model	2		
Database Design; Optimization, Normal forms	2		
Entities; Relations; Constraints; Views (II)	2		
Physical database design	2		
Indexes	2		
Relational Algebra	2		
Relational Calculus	2		
Query by example	2		
Structured Query Language – SQL	2		
Database administration; Security	2		
Database Applications	2		
Bibliography			
<ol style="list-style-type: none"> Alexandru Leluțiu - <i>Perenitatea Conceptelor Promovate de BAZELE de DATE</i>, Ed. Albastra, 2003 Raghu Ramakrishnan and Johannes Gehrke - <i>Database Management Systems</i>, McGraw-Hill Science, 2002 Hector Garcia-Molina, Jeff Ullman, and Jennifer Widom - <i>First Course in Database Systems</i>, Prentice Hall, 2001 P. O'Neil, E. O'Neil - <i>DATABASE Principles, Programming and Performance</i>, Academic Press Morgan Kaufmann, 1994 Philip Greenspun - <i>SQL for Web Nerds</i>, http://philip.greenspun.com/sql/ Ryan K. Stephens, Ronald R. Plew, - <i>Teach Yourself SQL in 21 Days</i>, Prentice Hall, 1999 			
8.2 Applications – Seminars/Laboratory/Project	Hours	Teaching methods	Notes
Microsoft SQL Server presentation	2	Exposure and applications	Computers, MS SQL Server, MySQL, Apache Web Server, PHP
MS SQL Server administration	2		
MS SQL Server databases: Tables; Relationships; Database diagrams	2		
MS SQL Server databases: Indexes; Constraints; Views	2		
MS SQL Server databases: INSERT, UPDATE, DELETE	2		
Structured Query Language – SQL – Simple SELECT	2		
Structured Query Language – SQL – Advanced SELECT	2		
MySQL presentation; MySQL administration	2		
MySQL databases	2		
Examples of Web Database Applications	2		
Database design – simple examples	2		
Database design – more complex examples	2		
Project Work – Web Database Applications	2		
Final laboratory work evaluation	2		
Bibliography			

1. Raghu Ramakrishnan and Johannes Gehrke - *Database Management Systems*, McGraw-Hill Science, 2002
2. Hector Garcia-Molina, Jeff Ullman, and Jennifer Widom - *First Course in Database Systems*, Prentice Hall, 2001
3. Philip Greenspun - *SQL for Web Nerds*, <http://philip.greenspun.com/sql/>
4. Ryan K. Stephens, Ronald R. Plew, - *Teach Yourself SQL in 21 Days*, Prentice Hall, 1999

*Se vor preciza, după caz: tematica seminariilor, lucrările de laborator, tematica și etapele proiectului.

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

Database is a topic of Computer Engineering and Information Technology field, combining fundamental aspects and practical software tools. Explaining to students the principles of database implementation, database design and implementing database application. Course content it is similar to database courses in other universities in the country and abroad.

10. Evaluation

Activity type	Assessment criteria	Assessment methods	Weight in the final grade
Course	Solving problems and answers to theoretical questions	2.5 hours written evaluation face to face or using TEAMS platform, if necessary	60% (a grade greater than 5 is mandatory)
Seminar			
Laboratory	Presenting databases implemented in 2 different DBMS; Knowing Structured Query Language Project Work: Web Database Applications	Ongoing evaluation face to face or on-line using TEAMS platform, if necessary Final presentation face to face or on-line using TEAMS platform, if necessary	30% (a grade greater than 5 is mandatory) 10%
Project			

Minimum standard of performance:

Solving practical laboratory work, implementing a database and a database application, solving the SQL Structured Query Language problem and another two out of the four other subjects.

Grade calculus: 40% lab + 60% final exam

Conditions for participating in the final exam: Lab \geq 5

Conditions for promotion: final exam \geq 5

Date of filling in:	Titulari	Titlu Prenume NUME	Semnătura
	Course	S.I.dr.ing. Calin Cenan	
	Applications	Conf.dr.ing. Delia Mitrea	

Date of approval in the department	Head of department Prof.dr.ing. Rodica Potolea
Date of approval in the Faculty Council	Dean Prof.dr.ing. Liviu Miclea