

SYLLABUS

DATABASES

1. Information on academic programme

1.1. University	„1 Decembrie 1918” University of Alba Iulia
1.2. Faculty	Faculty of Informatics and Engineering
1.3. Department	Informatics, Mathematics and Electronics
1.4. Field of Study	Computer Science
1.5. Cycle of Study	Undergraduate
1.6. Academic programme / Qualification	Computer Science /ESCO-08: 2511/ Systems Analyst, 2512/ Software developers Analyst 251201 Computer System Programmer 251204 Computer System Engineer 251203

2. Information of Course Matter

2.1. Course		Databases		2.2. Code		CSE 201	
2.3. Course Leader			Muntean Maria-Viorela				
2.4. Seminar Tutor			Muntean Maria-Viorela				
2.5. Academic Year	II	2.6. Semester	I	2.7. Type of Evaluation (E – final exam/ CE - colloquy examination / CA -continuous assessment)	E	2.8. Type of course (C– Compulsory, Op – optional, F - Facultative)	C

3. Course Structure (Weekly number of hours)

3.1. Weekly number of hours	4	3.2. course	2	3.3. seminar, laboratory	2
3.4. Total number of hours in the curriculum	56	3.5. course	28	3.6. seminar, laboratory	28
Allocation of time:					Hours
Individual study of readers					30
Documentation (library)					10
Home assignments, Essays, Portfolios					25
Tutorials					2
Assessment (examinations)					2
Other activities					-

3.7 Total number of hours for individual study	69
3.8 Total number of hours in the curriculum	56
3.9 Total number of hours per semester	125
3.10umber of ECTS	5

4. Prerequisites (*where applicable*)

4.1. curriculum-based	-
4.2. competence-based	<i>C5. Design and management of databases</i>

5. Requisites (*where applicable*)

5.1. course-related	Room equipped with video projector / board / Microsoft Teams Platform
5.2. laboratory-based	<i>Laboratory – computers, Software: MySQL server, MySQL graphical user interfaces (MySQL Workbench, MySQL Front,), Internet access. / Microsoft Teams Platform</i>

6. Specific competences to be acquired (chosen by the course leader from the programme general competences grid)

Professional competences	<i>C5.1. The identification of base concept for organizing data in databases. C5.2. The identification and explanation of base models for the organizing and management of data in databases. C5.3 The use of methodologies and database design environments for specific problems. C5.4. The evaluation of quality for various database management systems regarding structure, functionality and extensibility. C5.5. The development of various database related projects.</i>
Transversal competences	

7. Course objectives (as per the programme specific competences grid)

7.1 General objectives of the course	- <i>Technical equipment: laptop/PC, video projector</i> - <i>For students: course support in editable format</i>
7.2 Specific objectives of the course	- <i>Technical equipment: laptop/PC, video projector</i>

8. Course contents

8.1 Course (learning units)	Teaching methods	Remarks
1. Database architecture	<i>Lecture, conversation, exemplification</i>	2h
2. Data models	<i>Lecture, conversation, exemplification</i>	2h
3. Relational databases	<i>Lecture, conversation, exemplification</i>	2h
4. Relational algebra	<i>Lecture, conversation, exemplification</i>	2h
5. Relational keys	<i>Lecture, conversation, exemplification</i>	2h
6. Database normalization. First Normal Form	<i>Lecture, conversation, exemplification</i>	2h
7. Database normalization. Second Normal Form	<i>Lecture, conversation, exemplification</i>	2h
8. Database normalization. Third Normal Form	<i>Lecture, conversation,</i>	2h

	<i>exemplification</i>	
9. Select SQL	<i>Lecture, conversation, exemplification</i>	4h
10. Relational database schemes	<i>Lecture, conversation, exemplification</i>	4h
11. Conceptual design of databases	<i>Lecture, conversation, exemplification</i>	2h
12. Logical database design	<i>Lecture, conversation, exemplification</i>	2h
Laboratories		
	Teaching methods	
1. MySQL server installation and configuration. The MySQL graphical administration interfaces.	<i>Project-work, computer-based activities, laboratory activities</i>	2h
2. Creating a new MySQL database using GUI. Creating MySQL tables using GUI. MySQL data types.	<i>Project-work, computer-based activities, laboratory activities</i>	2h
3. Dropping a MySQL table using GUI. Renaming a table using GUI. Modifying the table structure using GUI.	<i>Project-work, computer-based activities, laboratory activities</i>	2h
4. Defining primary and foreign keys using GUI. Creating MySQL foreign key relationships. The databases export. The databases restore. Creating a database diagram.	<i>Project-work, computer-based activities, laboratory activities</i>	2h
5. Insert, update, and delete table data using GUI.	<i>Project-work, computer-based activities, laboratory activities</i>	2h
6. Database normalization. The First Normal Boyce-Codd Form (1NF). Steps and examples. Databases implementation in the 1NF.	<i>Project-work, computer-based activities, laboratory activities</i>	2h
7. Database normalization. The Second Normal Boyce-Codd Form (2NF). Steps and examples. Databases implementation in the 2NF.	<i>Project-work, computer-based activities, laboratory activities</i>	2h
8. Database normalization. The Third Normal Boyce-Codd Form (3NF). Steps and examples. Databases implementation in the 3NF.	<i>Project-work, computer-based activities, laboratory activities</i>	2h
9. Creating a new database using SQL instructions (<i>CREATE DATABASE</i> command). Setting the database as default (<i>USE</i> command). Dropping a database (<i>DROP</i> command). Creating tables using SQL <i>CREATE TABLE</i> .	<i>Project-work, computer-based activities, laboratory activities</i>	2h
10. Modifying the table structure (<i>ALTER TABLE</i> statement). View table structure (<i>DESCRIBE</i> command). Renaming a table (<i>RENAME TABLE</i> command). Deleting a table (<i>DROP TABLE</i> command).	<i>Project-work, computer-based activities, laboratory activities</i>	2h
11. Inserting data into tables (<i>INSERT INTO</i> statement). Viewing table data (<i>BROWSE</i> command). Modifying table data (<i>UPDATE</i> statement). Deleting table data (<i>DELETE</i> command).	<i>Project-work, computer-based activities, laboratory activities</i>	2h
12. Queries (SQL <i>SELECT</i> statement). <i>SELECT</i> list. SQL <i>WHERE</i> clause. SQL <i>ORDER BY</i> clause.	<i>Project-work, computer-based activities, laboratory activities</i>	2h
13. Queries (SQL <i>SELECT</i> statement). SQL <i>JOIN</i> (<i>CROSS JOIN, JOIN USING, NATURAL JOIN, JOIN ON, OUTER JOIN ON</i>).	<i>Project-work, computer-based activities, laboratory activities</i>	2h

Views (SQL <i>CREATE VIEW</i> statement).		
14. Project presentation and evaluation	<i>Project-work, computer-based activities, laboratory activities</i>	2h

References

1. **SQL COOKBOOK: *Query Solutions and Techniques for All SQL Users*, Anthony MOLINARO; Robert de GRAAF (2021), ISBN: 9781492077442.**
2. Colin Titchie, *Relational Database Principle*, 2nd edition, UK by TJ International, Padslow, Cornwall, 2004.
3. Terry Halpin, Tony Morgan, *Information Modeling and Relational Databases*, second edition, Morgan Kaufmann Publishers is an imprint of Elsevier. 30 Corporate Drive, Suite 400, Burlington, MA 01803, USA.
4. Mark Levene and George Loizou, *A Guided Tour of Relational Databases and Beyond*, Springer-Verlag Berlin Heidelberg.
5. Kroenke, David M, *Database Processing: Fundamentals, Design & Implementation*, New Jersey: Prentice Hall, 2000.
6. Saeed K. Rahimi, Frank S. Haug, *Distributed Database Management Systems: A Practical Approach*, Hoboken, New Jersey: Wiley Publishing INC, 2010.
7. Lambert M. Surhone, Mariam T. Tennoe, Susan F. Henssonow, *Distributed Database: Database Management System, Computer Storage, Routing Protocol*, Beau Bassin, Mauritius: Betascript Publishing, 2010.
8. Weinberg, P., Groff, J., Opper, A., *SQL The Complete Reference*, Third Edition, The McGraw-Hill Companies, Inc., ISBN: 978-0-07-159255-0, 2010.
9. Schneider, R., D., *MySQL Database Design and Tuning*, Sams Publishing, ISBN: 0-672-32765-1, 2005.
10. Date, C., J., *SQL and Relational Theory*, 1st Edition, O'Reilly Media, Inc., ISBN: 978-0-596-52306-0, 2009.

9. Corroboration of course contents with the expectations of the epistemic community's significant representatives, professional associations and employers in the field of the academic programme

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10. Assessment

Activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of final grade
10.4 Course	<i>Final evaluation</i>	<i>Written evaluation</i>	50%
10.5 Seminar/laboratory	<i>Laboratory activities portfolio</i>	<i>Practical evaluation</i>	50%
10.6 Minimum performance standard: minimum 5 at written evaluation and minimum 5 at practical evaluation			

Submission date

Course leader signature

Seminar tutor signature

Date of approval by Department members

Department director signature
