SYLLABUS

DATABASES

1. **Information on academic programme**

1.1. University	**„1 Decembrie 1918" University of Alba Iulia**
1.2. Faculty	**Faculty of Exact Sciences 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**

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	*1. Algorithms and data structures*
4.2. competence-based	*C5. Design and management of databases*

5. **Requisites** (*where applicable*)

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

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

Professional competences	*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.*
Transversal competences	

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

7.1 General objectives of the course	*- To support Course slides, information* *- For students: course support in editable format* *- Technical equipment: laptop, video projector*
7.2 Specific objectives of the course	*- To support the seminar: informative* *- Technical equipment: laptop, projector*

8. Course contents

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

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

	activities, laboratory activities	

References

1. **Colin Titchie, *Relational Database Principle*, 2nd edition, UK by TJ International, Padslow, Cornwall, 2004.**
2. **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.**
3. **Mark Levene and George Loizou, *A Guided Tour of Relational Databases and Beyond*, Springer-Verlag Berlin Heidelberg.**
4. **Kroenke, David M, *Database Processing: Fundamentals, Design & Implementation*, New Jersey: Prentice Hall, 2000.**
5. **Saeed K. Rahimi, Frank S. Haug, *Distributed Database Management Systems: A Practical Approach*, Hoboken, New Jersey: Wiley Publishing INC, 2010.**
6. **Lambert M. Surhone, Mariam T. Tennoe, Susan F. Henssonow, *Distributed Database: Database Management System, Computer Storage, Routing Protocol*, Beau Bassin, Mauritius: Betascript Publishing, 2010.**
7. **Weinberg, P., Groff, J., Oppel, A., *SQL The Complete Reference*, Third Edition, The McGraw-Hill Companies, Inc., ISBN: 978-0-07-159255-0, 2010.**
8. **Schneider, R., D., *MySQL Database Design and Tuning*, Sams Publishing, ISBN: 0-672-32765-1, 2005.**
9. **Date, C., J., *SQL and Relational Theory*, 1st Edition, O'Reilly Media, Inc., ISBN: 978-0-596-52306-0, 2009.**

1. **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**

2. **Assessment**

Activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of final grade
10.4 Course	*Final evaluation*	*Written evaluation*	50%
10.5 Seminar/laboratory	*Laboratory activities portfolio*	*Practical evaluation*	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

_____ _____