UNIVERSITY OF ECONOMICS - VARNA

FACULTY OF INFORMATICS

DEPARTMENT OF INFORMATICS

Adopted by the FC (record № 9/24.04.2024)

Adopted by the DC (record № 10/16.04.2024)

ACCEPTED BY:

Dean:

(Prof. Vladimir Sulov, PhD)

SYLLABUS

SUBJECT: DATABASE FUNDAMENTALS

DEGREE PROGRAMME: Computer Science; MASTER`S DEGREE

YEAR OF STUDY: 5 for other field graduates; SEMESTER: 10 for other field graduates

TOTAL STUDENT WORKLOAD: 360 hours; incl. curricular 60 hours

CREDITS: 12

DISTRIBUTION OF STUDENT WORKLOAD ACCORDING TO THE CURRICULUM

TYPE OF STUDY HOURS	**WORKLOAD, hours**	**TEACHING HOURS PER WEEK, hours**
CURRICULAR: incl. • LECTURES • SEMINARS / LAB. EXERCISES	 30 30	 2 2
EXTRACURRICULAR	300	-

Prepared by:

1. **……**
   (Prof. Julian Vasilev, PhD)
2. **……**
   (Assoc. Prof. Ivan Kuyumdzhiev, PhD)
3. **……**
   (Chief Assist. Prof. Miglena Stoyanova, PhD)

Head of department: ……..
of Informatics (Prof. Julian Vasilev, PhD)

I. ANNOTATION

The course "Database Fundamentals" provides students with fundamental knowledge on essential concepts of databases, database management system database (DBMS) and the SQL language - standard for working with relational databases. Gained knowledge form practical skills for the design and implementation of relational databases and programming scripts in SQL language.

Practical exercises using up to date licensed software develop research skills and the ability to search and decision making on case studies. Coursework assignment allows the formation and development of students' teamwork skills.

The knowledge and skills are used and expanded in other disciplines including programming and mobile application development.

In the course of training, the following key competencies are applied and developed, according to the recommendation of the Council of the European Union dated May 22, 2018, namely:

Digital competence. Understanding the principles and logic of database development as well as mastering the skills to execute scripts in the SQL language.

Mathematical competence and competence in exact sciences, technologies and engineering - mathematical ways of thinking underlies relational algebra and the SQL language.

Personal - Ability to deal with complex situations and uncertain environments caused by user requirements and the complexity of working with databases.

II. THEMATIC CONTENT

№	TITLE OF UNIT AND SUBTOPICS	NUMBER OF HOURS		
		L	S	L.E.
Theme 1. BASIC OPERATIONS WITH MYSQL DBMS ON XAMPP SERVER		**4**	**3**	
1.1	Relational database model	1	-	
1.2	Creating new databases	1	1	
1.3	Creating new tables in the databases	1	1	
1.4	Data input	1	1	
Theme 2. WORKING WITH DATABASES ON ANOTHER COMPUTER		**4**	**3**	
2.1	Connecting to another computer	1	1	
2.2	Creating and working with a database on another computer.	3	2	
Theme 3. WORKING WITH MYSQL COMMAND CONSOLE		**4**	**6**	
3.1	Basic command for working with MySQL command console	2	3	
3.2	Create table SQL queries.	2	3	
Theme 4. Structured Query Language (SQL)		**15**	**16**	
4.1	SQL – features, standards, basic operators	2	2	
4.2	Data integrity. Mechanisms to ensure data integrity – PRIMARY KEY, UNIQUE, FOREIGN KEY, CHECK.	2	2	
4.3	SQL. Create queries to extract data from one table; set the criteria for selecting records; set computed columns. Order the results.	2	3	
4.4	SQL - extract data from multiple tables; join tables. Subqueries and Correlated Subqueries	3	3	
4.5	SQL – aggregating data with GROUP BY.	4	4	
4.6	SQL – update and delete queries.	2	2	
Theme 5. EXPORT AND IMPORT DATA IN MYSQL		**3**	**2**	
5.1	Export data from MySQL	2	1	
5.2	Import data in MySQL	1	1	
	Total:	**30**	**30**	

III. FORMS OF CONTROL:

№	TYPE AND FORM OF CONTROL	Number	extracurricular, hours
1.	**Midterm control**		
1.1.	Preparation and defense of a course work with at least 2 create queries	1	60
1.2.	Preparation and defense of a course work with at least 2 insert queries	1	60
1.3.	Preparation and defense of a course work with at least 2 select queries	1	60
	Total midterm control:	**3**	**180**
2.	**Final term control**		
2.1.	Examination - Creating 2 select queries on the basis of a short textual description	1	60
2.2.	Examination - Creating 1 create or insert query on the basis of a short textual description	1	60
	Total final term control:	**2**	**120**
	Total for all types of control:	**5**	**300**

IV. LITERATURE

REQUIRED (BASIC) LITERATURE:

1. Gillenson,M. Fundamentals of Database Management Systems, John Wiley & Sons, 2023
2. Smirnova, S., Tezuysal, A. MySQL Cookbook, O'Reilly Media, 2022

RECOMMENDED (ADDITIONAL) LITERATURE:

1. Designing Databases. https://docs.microsoft.com/en-us/previous-versions/sql/sql-server-2008-r2/ms187099(v=sql.105)?redirectedfrom=MSDN. (5.04.2024 г.)
2. Dyer, R. Learning MySQL and MariaDB: Heading in the Right Direction with MySQL and MariaDB. O'Reilly Media, Inc, 2015
3. West, R., Assaf, W., Noble, E., Longoria, M., D'Antoni, J., Davidson, L. SQL Server 2022 Administration Inside Out, Pearson Education, 2023