

UNIVERSITY OF ECONOMICS - VARNA
MASTER DEGREE CENTER
DEPARTMENT OF INFORMATICS

Adopted by the FC (record №8 / 05.03.2020)

Adopted by the DC (record №6 / 17.02.2020)

ACCEPTED BY:

Dean:

(prof. Vladimir Sulov, PhD)

SYLLABUS

SUBJECT: "DATABASE FUNDAMENTALS"

DEGREE PROGRAMME: "Computer Science"; MASTER`S DEGREE

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

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

CREDITS: 12

DISTRIBUTION OF STUDENT WORKLOAD ACCORDING TO THE CURRICULUM

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

Prepared by:

1.
(Assoc. prof. Ivan Kuyumdzhiev, PhD)

2.
(Chief Assist. prof. Olga Marinova, 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.

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. | Practice Test | 2 | 50 |
| 1.2. | Course project | 1 | 80 |
| | Total midterm control: | 3 | 150 |
| 2. | Final term control | | |
| 2.1. | Examination (test) | 1 | 170 |
| | Total final term control: | 1 | 170 |
| | Total for all types of control: | 5 | 300 |

IV. LITERATURE

REQUIRED (BASIC) LITERATURE:

1. Hernandez, M. (2013) Database Design for Mere Mortals: A Hands-On Guide to Relational Database Design, Addison-Wesley
2. Andrew Cumming A., Gordon Russell G. (2006) SQL Hacks. O'Reilly Media, Inc
3. Microsoft SQL Server Books Online - msdn.com

RECOMMENDED (ADDITIONAL) LITERATURE:

1. Basit, A. SQL Server Development Essentials. Packt Publishing Ltd., 2014.
2. Dye, D. at al. SQL Server T-SQL Recipes. Apress, 2015.
3. Dyer, R. Learning MySQL and MariaDB: Heading in the Right Direction with MySQL and MariaDB. O'Reilly Media, Inc, 2015
4. Itzik, Ben-Gan. T-SQL Fundamentals (3rd Edition). Microsoft Press, 2016.
5. Teorey, T., et al. Database Modeling and Design: Logical Design, V-th ed. Morgan Kaufmann Publishers, 2011.
6. Davidson, L. Ten Common Database Design Mistakes. <https://www.red-gate.com/simple-talk/sql/database-administration/ten-common-database-design-mistakes/>. (5.02.2020 г.)
Designing Databases. [https://docs.microsoft.com/en-us/previous-versions/sql/sql-server-2008-r2/ms187099\(v=sql.105\)?redirectedfrom=MSDN](https://docs.microsoft.com/en-us/previous-versions/sql/sql-server-2008-r2/ms187099(v=sql.105)?redirectedfrom=MSDN) (5.02.2020 г.)