

Faculty: FACULTY OF TELECOMMUNICATIONS AND MANAGEMENT
Department: INFORMATION TECHNOLOGIES
Professional Field: 5.3 COMMUNICATION AND COMPUTER TECHNOLOGY
Specialty: CYBER SECURITY OF COMMUNICATION TECHNOLOGIES
Educational-qualification degree: BACHELOR

LEARNING COURSE DESCRIPTION

1. Course title: DATABASES

2. Course code: B.43.011.1

3. Type of the course: compulsory

4. Level: Bachelor

5. Year of study: first

6. Semester: second

7. Number of credits: 6

8. Name of the lecturer: Assoc. Prof. Dr. Eng. Pavlinka Radoyska,

9. Course learning outcomes:

The aim of the course is to give students in a systematic way basic knowledge and practical skills of methods for creating databases (DB) and the general principles of their operation, theoretical and applied issues, application of contemporary database management systems (DBMS) and automated information systems (AIS). The course is practically oriented and acquaints students with contemporary databases, logical and physical organization of data, different models of data presentation, methods of access and information retrieval in databases, the correspondence between the logical structure and the physical organization of the database and etc.

Students who have completed their training in the discipline must acquire:

Basic knowledge of

Студентите, приключили обучението си по дисциплината, *трябва да придобият:*

Basic knowledge of the description of the objects of the subject area, their attributes and the relationships between them, the principles of operation of relational database management systems, methods for designing a relational database, methods for access and search in databases, etc.

Practical skills for designing a relational database, working with relational databases - defining tables and relationships between them, defining business constraints, defining queries and views, installing and administering a database management system. Practical skills for analysis of the subject area, for creating an infological model and a conceptual scheme of the database.

Competencies: Upon successful completion of the course, students should be able to:

- explain concepts related to the management of relational databases and the principles of their operation;
- to work with relational databases - to design a database, to define queries and views, to analyze possible relational schemes;
- to administer relational databases - to create users, to track their activity, to take care of security, to create backups and to restore a database.

After mastering the SQL language, the student will become a qualified user of relational databases. After learning the basics of the PL/SQL language, the student will gain the skills of a programmer dealing with the application of AIS application logic, which are based on databases.

10. Teaching methods:

The lectures are conducted by acquainting the students with the material provided in the curriculum. The lectures are illustrated with graphic and video material, with illustrative examples and tasks, which are presented through presentations with a multimedia projector.

The practical exercises are held in a computer room equipped with modern computers and Internet access and each student works independently.

According to the specifics of the course and to achieve the goals, objectives and expected results in organizing extracurricular activities, the following forms of independent work are provided:

- preparation for conducting practical exercises;
- solving tests for self-preparation;
- solving tasks for independent work.

Each student receives homework, which consists of designing a database for any subject area. The result of the homework is the creation of a database, a user interface to the database and a guide for using the created database. The homework report is submitted electronically no later than 10 days after the end of the semester.

All necessary materials for the independent work of the students are available in the e-learning system of VUTP.

11. Prerequisites:

Students should have prior knowledge of Introduction to the specialty.

Courses using the course are: Database Management Systems, Data Archiving Systems - Backup., Integration of Database Systems., Large Data Management Systems, Large Data Management Systems.

12. Course contents:

The course covers topics related to the data model (data structuring, data operations, integrity constraints, relational data model), database design (stages of AIS design based on databases, ER model, attributes and connections, generalization and specialization, selection of database management system and other software tools, normalization and denormalization), database management systems (DBMS), SQL language for databases, organization of the database interface, physical organization of the data and mechanisms for access, ensuring data protection in the database, perspective directions for the development of the database.

13. Bibliography

Basic literature:

1. Carlos Coronel, Steven Morris, Database Systems: Design, Implementation, & Management, ISBN 978-1-305-86679-9, Cengage Learning, 2017
2. Chopra Rajiv, Database Management System (DBMS): A Practical Approach, 5th Edition, ISBN: 978-8121932455, S.Chand, 2016
3. Радослава Христова, Димитър Димитров, Ръководство по бази от данни, ISBN 9789540738840, УИ "Св. Климент Охридски", 2015
4. Джоан Ламбърт, Джойс Кокс, Microsoft Access 2013. Step by Step, ISBN: 9789546563019, AlexSoft, 2015
5. Юлиана Пенева, Принципи на базите от данни, ISBN: 9789545359996, Нов български университет, 2017

Additional literature:

1. Радева, С. Информационни технологии и бази от данни. ВУ КТП, София, 2011.
2. Радева, С. Бази от данни. ВУ КТП, София, 2011.
3. Ramez Elmasri, Shamkant Navathe, Fundamentals of Database Systems (4th Edition), ISBN 10: 0321122267 ISBN 13: 9780321122261, Addison Wesley, 2003
4. Lynn Beighley, Head First SQL: Your Brain on SQL -- A Learner's Guide, ISBN-10: 0596526849, ISBN-13: 978-0596526849, O'Reilly Media; 1 edition (September 1, 2007)
5. Ернандес, М. Проектиране на бази от данни, ISBN 954-685-301-1, Софтпрес, 2004
6. Database Management System (DBMS), <https://www.geeksforgeeks.org/dbms/>
7. Цветанка Георгиева-Трифенова, Практикум по бази от данни - I част, ISBN: 978-954-524-834-4, Университетско издателство "Св. св. Кирил и Методий", 2012
8. Денис Колисниченко, PHP 7 & MySQL - практическо програмиране, ISBN: 9786197356328, Асеновци, 2018
9. Гордън Ръсел, Андрю Къминг, SQL Хакове: Съвети и инструменти за изследване на вашите данни, ISBN: 9789549341225, ЗеСТ Прес, 2008

10. Michael McLaughlin, DBMS Tutorial, https://w_Oracle Database 12c PL/SQL Programming 1st Edition, ISBN-10: 0071812431 , ISBN-13: 978-007181243, McGraw-Hill Education; 1 edition (February 14, 2014)
11. www.w3schools.in/dbms/
12. MySQL Administration, <http://www.mysqltutorial.org/mysql-administration.aspx>
13. MySQL Tutorial, <https://www.tutorialspoint.com/mysql/index.htm>

14. Assessment methods and criteria:

A point system is used to assess students.

Knowledge, skills and competence are assessed by conducting two tests to check the theoretical and practical mastery of the study material, presentation of students during the practical exercises, as well as their ability to independently solve practical problems. The tests are conducted during the semester.

The grade for the course is formed on the basis of a point system and the maximum number of points that students can receive is 100. They are formed by the following activities:

- First test during the semester - 15 points;
- Second test during the semester - 15 points;
- Homework solution - 30 points;
- Final test on the exam date - 40 points.

Tests can include open and closed questions.

15. Language of instruction: *Bulgarian*