

**Faculty:** Telecommunications and Management  
**Department:** Information Technologies  
**Professional Field:** 5.3 Communications and computer technologies.  
**Specialty:** COMPUTER TECHNOLOGIES  
**Educational-qualification degree:** Prof. Bachelor

## LEARNING COURSE DESCRIPTION

**1.Course title:** Database systems integration

**2.Course code:** B.42.041.2

**3.Type of the course:** electiv

**4.Level:** Prof. Bachelor

**5.Year of study:** 3

**6.Semester:**5

**7.Number of credits:** 6

**8.Name of the lecturer:** Assoc. Prof. Egnar Yozdikililler, Eng. PhD

**9.Course learning outcomes:**

*The aim of the course* is to present to the students in a systematized form theoretical and practical knowledge in the field of integration of various database systems, for the purpose of data exchange.

Students who have completed their studies in the course must acquire:

*Basic knowledge of* construction and administration of various database systems and XML, SOA, REST technologies.

*Practical skills* to be able to install and use at least one of the DBMS MySQL, PostgreSQL, MariaDB, etc., to integrate a created database with another type of data (another database, web service, microservice, file, etc.), to build an application that touches at least two types of data sources.

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

- explain concepts, principles and apply methods and models of DBMS and integrated systems;
- to choose the most appropriate toolkit when modeling a real system;
- to model the necessary systems, applying certain UML methods;
- draw reasonable conclusions and prepare USE CASE diagrams related to the system solution.

**10.Teachingmethods:**

During the lectures, the students get to know the intended material in sequence. The study material is illustrated with examples and applications that make the students' work in the exercises as easy as possible. The lectures are illustrated with graphic material that is presented through presentations with a multimedia projector and are complemented by demonstrations in a real environment. Exercises are held in the laboratory of the department, equipped with computers, if desired, the student can also use a personal computer.

**11. Prerequisites:** basic knowledge of databases, DBMS operating systems, networks and protocols.

**12. Course contents:**

The basic principles of operation and administration of heterogeneous database systems, the principles of XML, SOA and REST are studied in the course.

**13. Bibliography**

**Basic literature:**

1. Özsu M.T., Valduriez P., Principles of Distributed Database Systems, Fourth Edition, 3, ISBN 978-3-030-26252-5 ISBN 978-3-030-26253-2 (eBook), <https://doi.org/10.1007/978-3-030-26253-2>
2. Özsu, M.T., Valduriez, P. (2020). Database Integration—Multidatabase Systems. In: Principles of Distributed Database Systems. Online ISBN 978-3-030-26253-2, Print ISBN 978-3-030-26252-5, Springer, Cham. [https://doi.org/10.1007/978-3-030-26253-2\\_7](https://doi.org/10.1007/978-3-030-26253-2_7)
3. Garcia-Molina H., Ullman J., Widom J., Database Systems: The Complete Book Pearson; 2nd edition (June 5, 2008), ISBN-10 : 0131873253, ISBN-13 : 978-0131873254
4. Hegazi M.O., Distributed Database Systems Integration: Models and Approaches, LAP LAMBERT Academic Publishing (January 24, 2012), ISBN-10 : 9783847372974, ISBN-13 : 978-3847372974
5. Kuijpers B., Revesz P., Constraint Databases, ISSN 0302-9743, ISBN 3-540-22126-3 Springer-Verlag Berlin Heidelberg New York, 2004

### **Additional literature:**

1. Hassana Nassiri, Mustapha Machkour, Mohamed Hachimi, Integrating XML and Relational Data, Procedia Computer Science, ISSN 1877-0509, Volume 110, 2017, Pages 422-427
2. An Enterprise Guide on Service-Oriented Systems Integration, Software Engineering, 2022, <https://www.in-fopulse.com/blog/integration-approaches-service-oriented-systems>
3. Leonard Richardson, Mike Amundsen, Sam Ruby, RESTful Web APIs, ISBN: 9781449359737, O'Reilly Media, 2013
4. Schaller, Tony; Bukhres, Omran A.; Elmagarmid, Ahmed K.; and Liu, Xiangning, "The Integration of Database Systems" (1993). Department of Computer Science Technical Reports. Paper 1061. <https://docs.lib.purdue.edu/cstech/1061>

### **14. Assessment methods and criteria:**

The course ends with an exam.

#### **1. Requirements for the assessment of the six-point system**

The total number of points from the written exam that can be reached is 100. Each of the questions in the final exam carries 3 points, and the answer to the open question can carry up to 10 points.

#### **2. Formation of the final mark**

The evaluation of the subject is formed on the basis of a point system, as the maximum number of points that students can receive is 100. They are formed by the following activities:

- First test during the semester - 40 points;
- Second test during the semester – 40 points;
- Successful solving of practical tasks during the exercises - 20 points.

The formation of the final grade is based on the points obtained during the semester, and the correspondence between the number of points and the grade according to the six-point system is presented in Table 1.

Table 1.

| <b>Number of points</b> | <b>Assessment According to the 6-point Scale System</b> |
|-------------------------|---------------------------------------------------------|
| <b>0 – 20</b>           | <b>Fail 2 (F)</b>                                       |
| <b>20 – 39</b>          | <b>Fail 2 (FX)</b>                                      |
| <b>40 – 49</b>          | <b>Satisfactory 3.00 (E)</b>                            |
| <b>50 – 59</b>          | <b>Satisfactory 3.00 (D)</b>                            |
| <b>60 – 69</b>          | <b>Good 4.00 (C)</b>                                    |
| <b>70 – 84</b>          | <b>Very good 5.00 (B)</b>                               |
| <b>85 – 100</b>         | <b>Excellent 6.00 (A)</b>                               |

### **15. Language of instruction: Bulgarian/English**