

SYLLABUS OF THE ACADEMIC DISCIPLINE

«MODERN DATABASE MANAGEMENT SYSTEMS»

Educational program component – elective (3 credits)

Educational and	Information technology and project management
professional program	
Specialty	122 – Computer science
Discipline	12 – Information technology
Level of higher education	first (bachelor's)
Language of instruction	English
Teacher(s) profile	Piddubna Larysa Andriivna, Candidate of Physical
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Course page in Moodle	https://moodle.chnu.edu.ua/course/view.php?id=3797
Consultations	By arrangement

SUMMARY OF THE COURSE

This discipline is a logical continuation of the study of the programming direction "Databases". If in the discipline "Databases and Information Systems" the basics of building relational database models were studied, then here databases of the "client-server" architecture based on the PostgreSQL database are considered.

PostgreSQL is an object-relational database management system that was developed in the Computer Science Department of the University of California, Berkeley. This database is a direct descendant with open source code, supports SQL92/SQL99 and other modern features. POSTGRES is a pioneer in many objectrelational aspects that have now appeared in some commercial database systems. Traditional relational database systems support a data model that is a collection of named tuples that contain attributes of a given type. In modern commercial systems, possible types include floating-point numbers, integers, character strings, currency types, and dates. This leads to the fact that this model is inadequate for future data processing programs. The relational model successfully replaces previous models. PostgreSQL offers a significant increase in the power of the DBMS through the implementation of the following additional aspects that allow users to easily expand the system:

- inheritance;
- data types;
- functions.

The advantage of this software product is that it is distributed free of charge, without requiring licenses.

In this discipline, students are invited to master the basic capabilities of working in

PostgreSQL, having learned the psql language, check its operation in console mode, acquire skills in administering network databases, and get acquainted with the possibility of developing an interface part for PostgreSQL databases for publishing them in the web space or using them as an independent database. The methodology for developing a non-relational database in the environment of the document-oriented non-relational database MongoDB is also considered.

The purpose of the course. To consider typical methods for developing the backend part of modern software, methods of accessing data.

EDUCATIONAL CONTENT OF THE EDUCATIONAL COMPONENT

MODULE 1. DATABASE SCHEMA AND POSTGRESQL SYSTEM		
Topic 1	PostgreSQL system.	
Topic 2.	SQL language in PostgreSQL.	
MODULE 2. DATABASE SELECTION TOOLS.		
POSTGRESQL ADMINISTRATION		
Topic 3	SELECT data selection command.	
Topic 4	Concepts of views, indexes, cursors. Construction and their use.	
Topic 5	Concept of client. Psql client capabilities.	
Topic 6	Concept of users and groups. User and group management.	
Topic 7	Features of administration of relational and non-relational databases.	
MODULE 3. NON-RELATIONAL DATABASES. DOCUMENT-		
ORIENTED DATABASE MONGODB		
Topic 8	Basic concepts and characteristics of non-relational databases.	
Topic 9	Characteristics of MongoDB. Creating a database in the MongoDB	
	environment. Working with data.	

FORMS, METHODS AND EDUCATIONAL TECHNOLOGIES OF TEACHING

(description of forms, methods and technologies of teaching,

which are used in the process of studying the academic discipline)

By the source of transmission and perception of educational information by students:

o verbal (lecture, explanation, conversation, instruction);

o visual (illustration, demonstration);

o practical (projects).

By the logic of transmission and perception of educational information by students: o informational-receptive;

o reproductive;

o problem-based;

o partially-search (heuristic).

By stimulation of educational and cognitive activity:

o methods of stimulating cognitive needs and interests;

o methods of stimulating duty and responsibility.

FORMS AND METHODS OF CONTROL AND ASSESSMENT

Current control: The forms of current control are laboratory work. Final control - The form of final control is a test.

LEARNING OUTCOMES ASSESSMENT CRITERIA

The system of assessing the level of educational achievements is based on the principles of ECTS and is cumulative. Knowledge assessment is carried out on a 100-point scale. The results of work during the academic semester are assessed during current and modular

control in the range from 0 to 70 points in total, and the results of final control (test) - from 0 to 40 points.

During the semester, students perform 5 laboratory works, each of which is a continuation of the previous one. Laboratory works are assessed with points: 15, 15, 10, 15, 15 for the full completion of tasks.

Performing laboratory tasks involves independent processing of additional information sources and home completion of tasks started in the classroom. In case of insignificant errors in completing tasks, 1-2 points are deducted, and significant ones, unsubstantiated application of methods or failure to complete tasks - 3-5 points. In case of completing certified courses on educational platforms and timely submission of certificates, it is possible to transfer a certificate instead of laboratory work on the relevant topic. Additionally, you can get up to 14 points for completing additional tasks.

The final control in the discipline is a test in the form of a test in the moodle system. The test option contains 20 questions with one correct answer, each of which is estimated at 1 point.

The final grade is given based on the results of the sum of points scored on substantive modules during the semester and the final module (test).

ACADEMIC INTEGRITY POLICY

Adherence to the academic integrity policy by participants in the educational process when studying an academic discipline is regulated by the following documents:

- ✓ "Code of Ethics of Yuriy Fedkovych Chernivtsi National University" <u>https://www.chnu.edu.ua/media/jxdbs0zb/etychnyi-kodeks-chernivets</u> kohonatsionalnoho-universytetu.pdf
- ✓ "Regulations on the detection and prevention of academic plagiarism at Yuriy Fedkovych Chernivtsi National University" <u>https://www.chnu.edu.ua/media/n5nbzwgb/polozhennia-chnu-pro-plahi</u> at-<u>2023plusdodatky-31102023.pdf</u>

The applicant is obliged to complete all received tasks in a timely and highquality manner; if necessary, in order to clarify all unclear issues during independent and individual work, to attend consultations with the teacher. Students are also obliged to adhere to the rules of academic integrity in accordance with the "Code of Ethics of the ChNU". The policy of observing academic integrity (in accordance with the Law of Ukraine "On Education") is that teaching an academic discipline is based on the principles of academic integrity - a set of ethical principles and rules defined by law, which should be guided by participants in the educational process during training, teaching and conducting scientific (creative) activities in order to ensure trust in the results of training and/or scientific (creative) achievements. The presence of academic plagiarism in student works is grounds for assigning a negative grade. Cheating by students during testing is grounds for early termination of its completion and assigning a negative grade

INFORMATION RESOURCES

- 1. <u>https://moodle.chnu.edu.ua/course/view.php?id=3797</u>
- 2. <u>https://www.postgresql.org/</u>
- 3. https://www.enterprisedb.com/products/postgresql-databases
- 4. https://www.devart.com/dbforge/postgresql/
- 5. https://www.postgresqltutorial.com/postgresql-getting-started/what-ispostgresql/
- 6. https://elements.heroku.com/addons/heroku-postgresql