

Course name: **Databases**

No. of ECTS: **5**

Aim:

- Competences in the field of designing and building a transactional database;
- Competences of data manipulation and exploration in the transactional database using SQL;
- Shaping a responsible attitude towards using databases in a contemporary society.

Course content:

- Role and importance of databases in contemporary organizations. Fields where databases are used. Dangers related to databases exploitation;
- Relational data model and relational databases – basic terms, normalization, operations on relations, keys and indexes, data integrity, transactional processing;
- Designing relational databases - entities, relations between entities and their types, entities relations diagram. Transformation of entities relations' model to the relational model;
- Creating data structures and providing data integrity in a transactional database using SQL;
- Manipulating data in a transactional database using SQL(INSERT, UPDATE, DELETE);
- Data selection using SQL in a transactional database – eliminating repetitive values(DISTINCT), sorting displayed data(ORDER BY);
- Conditional data selection(WHERE), comparison operators(IN, LIKE, BETWEEN, AND, IS NULL), defining simple and complex conditions(operators AND and OR);
- Data set's joins, types of joins(INNER, LEFT, RIGHT, FULL, CROSS joins);
- Data aggregation(GROUP BY), simple and complex aggregates, aggregation functions(COUNT, MIN, MAX, SUM, AVG), defining conditions of aggregates' selection(HAVING).

Skills:

- Ability to define stages of transactional databases designing and draw detailed actions in each of them; list techniques of data manipulating in a transactional database; indicate environments and techniques of creating queries in a transactional database;
- Ability to design and create a transactional database; insert data, modify and delete it; define queries;
- Ability to identify dangers related to database exploitation.

Form of teaching:

Lecture, laboratory classes.