

MODULE INFORMATION SHEET

Name of Module Unit	Data Bases
Name in polish language	Bazy danych
Module type	compulsory / elective
Form of studying	full-time day courses
Level of study	graduate course (M.Sc. level)
Type of study (for extra-mural courses)	-
Programme	Environmental Engineering
Speciality	Environment Protection Engineering
Responsible department	Dept. of Informatics and Environment Quality Research
Responsible person	Dr inż. Mariusz Rogulski

Semester	Lectures(E)	Tutorials	Laboratory	Computer Exercises	Projects	ECTS
3	15			30		3

Learning outcomes (knowledge, skills, competences)

The course aims to familiarize students with the basic concepts associated with relational databases (RDB), the correct way to design data structures, their implementation in the RDB, the use of DML to build objects in RDB and SQL to create queries. There will be also discussed topics such as database security, transaction management and the opportunities and potential applications of different database systems which are available on the market.

The practical part is to acquire skills such as proper modelling entity relationships, create databases and database objects using available tools and SQL, writing SQL queries based on an environmental project.

Prerequisites

Information Technology

Rules for integrated grade setting

Arithmetic mean of the computer exercises and test. Scores of the test and the computer exercises not less than 3.

Recommended readings

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Contents of lectures (syllabus)

	Topics	Time (hrs.)	Scope (S / Ex)
1	Introduction to databases: data, database, database management system, information system with database	1	Ex
2	The architectures of the database applications	1	Ex
3	Modelling entity relationships diagrams. Transformation of model compounds entities in relational data model	1	Ex
4	Normalization, identifying a relationship type	1	Ex
5	Logical database model	1	Ex
6	SQL language, data types in SQL, DDL expressions used to create objects in the database	1	Ex
7	Manipulating data with SQL (DML - Insert, Update, Delete)	1	Ex
8	Creating queries by using DQL (basic queries, aggregate queries, subqueries)	1	Ex
9	PL / SQL language	1	Ex
10	Other database objects, managing transactions	1	Ex
11	Parallel access to data, data locking mechanisms	1	Ex
12	Security, rights management (schedules, roles), database performance	1	Ex
13	Methods of information management - an introduction to warehouses and data mining	1	Ex
14	Most popular contemporary database systems	1	Ex
15	Test	1	Ex
Total		15	hours

S – topics listed in the legal study programme standards from 12.07.2007

Ex – extended topics

Lecturers

Dr inż. Mariusz Rogulski

Assessment method

The positive evaluation of the test

Contents of computer exercises

	Topics	Time (hrs.)	Scope (S / Ex)
1	Identifying objects from an external model for the selected project	4	Ex
2	Creating entity relationships diagram for the selected project	4	Ex
3	Normalization	2	Ex
4	Transformation compounds of model entities in relational data model	2	Ex
5	Creating logical database model	4	Ex
6	Implementation of the created logical data model in database: creating tables, setting up the keys, constraints	4	Ex
7	Inserting, modifying and deleting data to tables	4	Ex
8	Using queries to view data: simple query with a WHERE clause, joining tables, aggregate queries, subqueries.	6	Ex
Total		30	hours

S – topics listed in the legal study programme standards from 12.07.2007

Ex – extended topics

Persons responsible for computer exercises

Dr inż. Mariusz Rogulski

Assessment method for computer exercises

The positive evaluation of the project created and implemented during computer exercises