COURSE DESCRIPTION CARD - SYLLABUS

Course name
Database systems [N1Inf1>SBD]

Course

Field of study
Computing

Year/Semester
2/4

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
16

Laboratory classes
20

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

5,00

Coordinators

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Lecturers

Prerequisites

A student starting this course should have basic knowledge of the basics of programming, computer system architecture, operating systems and database systems. He/she should have the ability to acquire information from indicated sources. They should also understand the necessity of broadening their competences and be ready to cooperate within a team. In addition, in terms of social competence the student must present such attitudes as honesty, responsibility, perseverance, cognitive curiosity, creativity, personal culture, respect for other people.

Course objective

The main goal is to provide students with basic knowledge of database systems technology, necessary for the proper design, use and implementation of database applications, and to develop students the skills of solving problems that arise during the management of database systems.

Course-related learning outcomes

Knowledge:
has well-ordered, theoretically grounded general knowledge in the area of databases, (K1st_W4)
has detailed knowledge of design and implementation of databases and software engineering,

(K1st_W5)
has basic knowledge about the life cycle of software information systems, (K1st_W6)
has basic knowledge of methods, techniques and tools used in solving simple computer tasks in the field of databases (K1st_W7)

Skills:
is able - according to given specification - to design and implement a simple information system, using proper methods, techniques and tools (K1st_U4)
is able to assess the correctness of functioning of the database system and is able to perform efficiency tests (K1st_U9)
is able to build simple database systems using at least one of the most popular database management systems (K1st_U10)
is able to develop and implement data processing algorithms using one of the popular tools (K1st_U11)

Social competences:
understands that knowledge and skills in the field of databases are becoming obsolete very quickly (K1st_K1)
knows examples and understands the causes of malfunctioning information systems that led to serious financial, social losses (K1st_K2)

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The learning outcomes outlined above are verified as follows:
Formative assessment:
(a) for lectures:
- On the basis of answers to questions on the material discussed in previous lectures;
b) in terms of exercises:
- on the basis of the evaluation of the current progress of the tasks.
Summative evaluation:
Verification of the knowledge acquired during the lectures is carried out by a written exam in the next semester, i.e. after the completion of the entire lecture series devoted to the problems of database systems.
Verification of the established learning outcomes of the laboratory is realized by:
- evaluation of the student's preparation for individual sessions of laboratory classes,
- conducting a final credit test on the knowledge of the issues presented in the laboratory.
To receive a passing grade in the laboratory, it is necessary to get at least a sufficient grade in the credit test. The following grading scale is adopted depending on the number of points obtained: <0;50%>: ndst, (50%;60%>: dst, (60%;70%>: dst+, (70%;80%>: db, (80%;90%>: db+, (90%;100%>: bdb.

Programme content

The course programme includes the following topics:
- Introduction to database systems; the concept and architecture of database systems;
- Relational data model, SQL language;
- Conceptual database schema modelling, Extended Entity Relationship model;
- Conceptual database schema transformation to relational schema;
- Normalization of logical database schemas;
As part of the lab, students will learn:
1. A declarative language for accessing relational databases called SQL, presented in a breakdown of the following topics:
- Simple queries.
- Advanced data selection.
- Grouping of data.
- Joins and collective operators.
- Subqueries.
- Advanced mechanisms in queries.
- Data manipulation language (DML).
- Data definition language (DDL).
- Views.

2 Principles of database modeling:
- Entity relationship modeling.
- Principles of entity relationship transformation to a selected implementation model.

Course topics

The topics of the classes include the following topics: Introduction to database systems;

concept and architecture of database systems; life cycle of a database system; modeling conceptual database schemas, EER diagrams, transformation of a conceptual database schema to an implementation schema, relational data model, relational algebra, relational tuple calculus, SQL language, normalization of logical database schemas, design of logical schemas of relational databases, logical organization of data,

As part of the laboratory, students will learn:

1. Declarative language for accessing relational databases called SQL, presented in the following topics:

- Simple queries.

- Advanced data selection.

- Data grouping.

- Joins and collective operators.

- Subqueries.

- Advanced mechanisms in queries.

- Data manipulation language (DML).

3
- Data definition language (DDL).

- Perspectives.
2. Principles of database modeling:
- Modeling entity relationships.
- Principles of transformation of entity relationships to the selected implementation model.

Part of the above-mentioned program content is implemented as part of the student's own work.

Didactic methods:
1. lecture: multimedia presentation, presentation illustrated with examples given on the board,
2. laboratory exercises: multimedia presentation, presentation illustrated with examples given on the board, practical exercises, workshops.

Teaching methods

1. lecture: multimedia presentation, presentation illustrated by examples given on the blackboard,
2. laboratory exercises: multimedia presentation, presentation illustrated by examples given on the blackboard, practical exercises, workshops.

Bibliography

Basic:
1. Garcia-Molina H., Ullman J.D., Widom J., Implementacja systemów baz danych, WNT, 2003
2. J.D. Ullman, J. Widom, Podstawowy wykład z systemów baz danych, WNT, W-wa, 2000
3. Elmasri R., Navathe S., Wprowadzenie do systemów baz danych, Wyd. Helion, (4th Edition), 2005
4. Jason Price, Oracle Database 12c i SQL : programowanie, Helion, Gliwice 20155. Jakubowski:

Additional:
1. Database Management Systems, 2nd edition, R. Ramakrishnan, J. Gehrke, WCB/McGraw-Hill, 2001
2. Readings in Database Systems, 5th edition, P. Bailis, J. M. Hellerstein, M. Stonebraker

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	38	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	87	3,00