



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Databases

Course

Field of study

Education in Technology and Informatics

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/4

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

25

Laboratory classes

45

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

Tomasz Bilski, BEng. PhD

tomasz.bilski@put.poznan.pl

tel. 61 665 35 54

FACULTY OF COMPUTING AND

TELECOMMUNICATIONS

ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Student should have basic knowledge on: operating systems, algebra, logic, programming methods and languages, data types and structures. Student should have abilities for information accessing from given sources and should be prepared to work in a team.

Course objective

Providing students with knowledge on databases foundations, including: designing, conceptual modelling, relational algebra, languages for relational databases with special emphasis on SQL, query formulation, database management with special emphasis on MS SQL Server, data security rules, storage system virtualization, data warehouses.



Course-related learning outcomes

Knowledge

Student has detailed knowledge on:

- relational database model (data structures, operations, integrity constraints),
- relational database design and implementation (entity-relationship model, transformation to relational database schema, normalization)
- physical structures, indexes used in modern databases,
- methods and rules for data protection.

Skills

Student can:

- built conceptual database model,
- perform operations in relational algebra,
- provide entity-relationship diagram,
- use common database management system,
- write queries in SQL.

Social competences

Student understands that:

- using IT tools must be law compliant,
- one of important database aspects is data protection,
- it is necessary to update knowledge about particular tools and database systems.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Theoretical knowledge is verified during test. To achieve positive result student should get more than 50% of points. Test topics are provided to students by email at the beginning of the semester.

Practical skills are verified during laboratory classes and during tests. To achieve positive result student should get more than 50% of points.

Programme content

Lecture

Foundations of databases. Data categories. Database classifications. Applications. Database integrity. Transactions. Conceptual modelling. Entity-relationship diagrams. Relational algebra. Relational



databases. Normalization. SQL. Queries. Database management systems. MS SQL Server. Methods and rules for data protection, including legal requirements (e.g. GDPR). Media and systems for data storage, cloud storage. Data storage virtualization. Data warehouses. Big data.

Laboratory

MS Access as simple (desktop) database system example. Building conceptual models. Performing operations in relational algebra. Designing entity-relationship diagrams. Building implementation models. Database normalization. Queries (simple, parametrical, cross) with SQL. Building forms and reports. Transactions, triggers.

Teaching methods

Interactive lecture (with questions for students) with a use of multimedia presentation. Files with slides provided to students.

Laboratory classes in a form of written exercises (eg. relational algebra) and practical. Tasks performed in person or in teams with a use of computer hardware, software tools and Internet resources.

Bibliography

Basic

C.J. Date, Wprowadzenie do systemów baz danych, Wydawnictwa Naukowo-Techniczne, Warszawa 2000 (in Polish, PUT Library signature: W 93773).

R. Elmasri R., S. Navathe, Wprowadzenie do systemów baz danych, Wyd. Helion, Gliwice, 2005 (in Polish, PUT Library signature: W 116833).

J.D. Ullman, J. Widom, Podstawowy kurs systemów baz danych, WNT, W-wa, 2011 (in Polish, PUT Library signature: 133861).

Additional

Ben-Gan Itzik, Podstawy języka T-SQL Microsoft SQL Server 2016 i Azure SQL Database, Wydawnictwo Promise, 2016 (in Polish).

<http://www.sql-tutorial.net/>

<https://www.sqlpedia.pl/>

<http://webmaster.helion.pl/index.php/kursmysql-projektowanie-relacyjnych-baz-danych>

<https://www.w3schools.com/sql/default.asp>



Breakdown of average student's workload

	Hours	ECTS
Total workload	120	4,0
Classes requiring direct contact with the teacher	70	2,5
Student's own work (literature studies, preparation for laboratory classes, preparation for tests, laboratory reports preparation) ¹	50	1,5

¹ delete or add other activities as appropriate