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MODULE DESCRIPTION CARD – SYLLABUS

This module is a part of the Intensive International Education Programs in the field of the ICT organised at Poznan University of Technology as part of the „IMPACT – Innowacyjne Międzynarodowe Programy w AI, Cyberbezpieczeństwie i Teleinformatyce" project implemented SPINAKER Program of the National Agency for Academic Exchange, financed by the European Social Development Fund 2021–2027 (ESDF).

Module name:	Number of hours:	Lecturer:
Module ICT07 Database systems	10	Paweł Boiński, PhD

Module Descriptions:

The primary objective of this course is to equip students with basic knowledge of database system technologies essential for the effective design and application of database systems. Furthermore, the course seeks to develop students' proficiency in utilizing database systems, with particular emphasis on data retrieval through the standard SQL query language. In addition to exploring the widely adopted relational model of data storage, the course will also introduce the fundamental concepts underlying NoSQL databases.

Purpose of the support under Module:

The overall objective of the Innovative International Education Program in ICT within the IMPACT project is to raise the competencies of international students in key digital technologies and to support personalized, flexible, and modern education aligned with current global needs in the area of ICT.

The specific objective of the module is to provide competencies and promote activities carried out at the Poznań University of Technology in the area of database systems, including:

- proficiency in utilizing database systems,
- data retrieval through the standard SQL query language,
- relational model of data storage,
- fundamental concepts underlying NoSQL databases.

Method of support under Module:

Support within the module is provided with the participation of the instructor and divided into the following elements:

- 6-week self-study program using teaching materials provided by the instructor on the e-learning platform;
- 6 weeks of support from the instructor in the form of online consultations using tools that enable meetings to be held;
- a test to verify the acquisition of competences.

Module-related learning outcomes:

Descriptions of the new competences:

The primary objective of this module is to develop students' competencies in addressing problems related to database systems, which constitute a fundamental component of modern information systems. Upon successful completion of the course, the student will attain the following specific learning outcomes:

Knowledge:

1. The student has a fundamental, theoretically grounded understanding of database systems.
2. The student demonstrates detailed knowledge of the relational data model, including data structures, operations, and integrity constraints.
3. The student exhibit comprehensive knowledge of the design and implementation of logical schemas for relational databases, encompassing conceptual modeling and their transformation into logical relational schemas.
4. The student understands the concept of transactions and their essential properties.
5. The student has a basic knowledge of physical storage and indexing structures used in database systems.
6. The student demonstrates fundamental proficiency in the SQL query language.
7. The student recognizes and understands the principal types of NoSQL database approaches.

Skills:

1. The student is able to design an appropriate relational database schema in accordance with a given specification.
2. The student can select an appropriate database model based on a defined set of application requirements.
3. The student is able to query the relational database using SQL language.

Social competences:

1. The student recognizes that the field of database systems remains an active area of scientific research and acknowledges the importance of continuous learning and professional development to enhance qualifications and competencies.

Criteria for verifying learning outcomes

Method of verification/validation of learning outcomes

Workload

25 h (including work with teaching materials provided by the lecturer, consultation, and the student's own work) – 1 ECTS point

Level of the European Qualifications Framework