COURSE DESCRIPTION CARD - SYLLABUS

Course name
Databases, scripting and data description languages [S2Teleinf2>BDJSiOD]

Course

Field of study
Teleinformatics

Year/Semester
1/1

Area of study (specialization)
–

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
0

Laboratory classes
0

Other
24

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

Lecturers

Prerequisites

Student starting this course should have a basic knowledge and skills in programming, especially with object-oriented one. Furthermore, basic knowledge of web pages description languages, such as HTML or CSS, is required. Student should also be able to acquire information from different suggested sources and present good teamwork skills.

Course objective

The main objective of this course is to provide students with basic knowledge on data storage methods, and data serialization languages for storing it as a text. Furthermore, knowledge and skills on using selected script languages for data processing will be developed.

Course-related learning outcomes

Knowledge:
1. Has broadened and in-depth knowledge of modern database systems and scripting languages [K2_W02]
2. Knows and understands algorithms used in ICT systems and their use in database systems [K2_W05]
3. Has advanced and detailed knowledge of the processes occurring in the life cycle of database systems, both in the context of hardware or software aspects; in this context, understands the importance of changing rules for data description and scripting languages [K2_W10]

Skills:
1. In order to properly use various types of database systems, he/she can obtain information from various available sources and is able to integrate them, draw conclusions and formulate opinions on the possibility of their use. [K2_U01]
2. In order to properly use the potential of database systems, he can use the known mathematical methods and models, as well as algorithmic solutions, modifying them if necessary, to implement projects in the field of ICT [K2_U06]
3. Knowing the dynamics of the development of scripting languages and database systems, he can determine directions for further learning and implement the self-education process [K2_U11]

Social competences:
1. Knowing the dynamics of the development of scripting languages and database systems, he is ready to recognize the importance of knowledge in solving cognitive and practical problems and to critically evaluate the received content. [K2_K01, K2_U18]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired in lectures will be verified with a written exam that consists of 6-10 questions (open- or test-type) which can be graded differently. The threshold for passing the exam is 50% of the total number of points that can be obtained.
Skills acquired in laboratory classes will be verified with 8-15 practical exercises, relying on implementation of specific programs or algorithms using selected script languages or data storage using selected mechanisms, according to the provided instructions. Each exercise will be graded with a specific number points depending on the completeness of the provided written report and the complexity of the task. The final grade will be also influenced by the overal engagement and dedication to work by the student, and, eventually, realization of additional homeworks. The final grade will depend on the percentage of collected points with the passing threshold equal 50%.
Grading scale: <50% - 2.0 (ndst); 50% to 59% - 3.0 (dst); 60% to 69% - 3.5 (dst+) ; 70% to 79% - 4.0 (db); 80% to 89% - 4.5 (db+); 90% to 100% - 5.0 (bdb).

Programme content

This course will cover the following topics:
1. Data storage methods and data serialization languages.
2. Basic information on databases.
3. Introduction to programming using selected script languages.
4. Use of scripting languages for the purpose of basic Internet services provisioning.
5. Use of script languages to work with databases.

Course topics

Lectures will cover the following topics:
1. Data storage methods and data serialization languages (e.g. XML, JSON).
2. Basic information on databases - types, advantages and disadvantages. Explanation of the structure and rules of operation of relational and non-relational databases.
3. Introduction to script languages - differences between scripting and compiled languages. Basic syntax of selected script languages (e.g. Python, JavaScript).
4. Use of scripting languages for the purpose of basic Internet services provisioning.
5. Storage, reading and manipulation of data described using serialization languages using selected script languages.
6. Use of script languages to work with databases. Methods of presentation (visualization) of data using script languages and other tools.
Laboratory exercises will consist of the following topics:
1. Data storage using data serialization languages (e.g. XML, JSON).
2. Design, creation and management of databases.
3. Implementation of simple programs using seleceted script (e.g. Python, JavaScript).
4. Realization of basic Internet services using selected script languages (www, HTTP queries).
5. Implementation of parsing and serialization mechanisms for data stored using data serialization

languages with selected script languages.
6. Manipulation of data retrieved from a database using selected script languages.
7. Presentation (visualization) of data using selected script languages and other tools.
8. Selected extensions of considered script languages (libraries, frameworsk, etc.).

Teaching methods

1. Lectures: multimedia presentation illustrated with examples given on the board.
2. Laboratories: realization of exercises using computers according to instructions provided by the teacher - practical exercises, eventually supplemented with multimedia presentation.

Bibliography

Basic:
Garcia-Molin H, Ullman J.D., Widom J., Implementacja systemów baz danych, WNT, 2003
Boschetti A., Massaron L., Python: podstawy nauki o danych, Helion, 2017
Suehring S., JavaScript: krok po kroku, RM, 2009
North S., Hermans P., XML dla każdego, Helion, 2000

Additional:
McKinney W., Python for data analysis, O'Reilly, 2013
Krajka A., Python: podstawy języka i aplikacje internetowe, Wyd. Uniwersytetu Marii Curie -Skłodowskiej, 2011
Hernandez M.J., Bazy danych dla zwykłych śmiertelnikó, Mikom, 2004
Czapla K., Bazy danych: podstawy projektowania i języka SQL, Helion, 2015
www.w3schools.com

Breakdown of average student's workload

	Hours	ECTS
Total workload	104	4,00
Classes requiring direct contact with the teacher	54	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	50	2,00