SYLLABUS

Name: *Theory of Data and Algorithms Spaces (InfAAu>SM3TofDaAS19)*
Name in Polish:
Name in English: *Theory of Data and Algorithms Spaces*

Information on course:
Course offered by department: Faculty of Automatic Control, Electronics and Computer Science
Course for department: Silesian University of Technology

Default type of course examination report:

ZAL

Language:

English

Course homepage:

https://platforma2.polsl.pl/rau2/course/view.php?id=1090

Short description:

Course objectives: introducing the listener to the issues of formulating a new field of Data and Algorithms Spaces and with particular emphasis on the construction of advanced data storage systems and data mining.

Prerequisites: knowledge of data storage and database concepts, knowledge of data structures, algorithms, systems and data architectures, ability to program in at least one object-oriented language, familiarity with data analysis concepts and techniques, basic understanding of ML/AI/LLM

Form of classes: on site

Description:

ECTS: 1
Total hours: 30 h (15 contact hours / 15 student's own work hours)
Lecture: 15 h
Student's own work: preparation for classes,

Detailed lectures programme's content:
· genesis of Data and Algorithms Spaces (DaAS),
· evolution of analytical systems (data warehousing, data mining),
· basics of DaAS scientific research (theory of data spaces (space-time, stream), theory of indexes in data space (space-time aggregate structures), theory of data privacy protection),
· advanced data storage systems, advanced data warehouses (aggregate granaries, grid data warehouses, stream data warehouses), Big Data Systems,
· advanced algorithms (hierarchical aggregation systems, data mining algorithms with protection of their privacy),
· management of selected data space and algorithms (trajectory and location management, Big Data management)

The content of study programme ensuring learning outcomes (according to the study programme):
· knowledge of basic and heuristic research in the field of Data and Algorithms Spaces,
· knowledge of research used in the construction of a new generation of large-scale global systems,
· ability to cooperate in formulating, describing and building elements of new theories, concepts and methods of ICT,
· ability to conduct preliminary analysis and assessment of the features of advanced IT systems and related innovative artifacts,
· competence of creative use of ToDaAS knowledge in industrial projects and understanding of conducting an innovative master's thesis.

Bibliography:

Research literature, scientific publications, technical reports made available during classes - articles published in conference materials VLDB, DEXA, SIGMOD, ICDE, ADBIS, ADVIS and in the journals of Lecture Notes in Computer Science and IEEE Computer Society.

Learning outcomes:

Knowledge: a student knows and understands:
K2A_W07 - advanced problems of algorithms and data structures (final project with presentation)
K2A_W06 - theoretically founded detailed issues in the field of computer science and the specialty studied (final project with presentation)

Skills: a student can
K2A_U01 - use the knowledge to formulate and solve complex and unusual problems and to perform tasks in unpredictable conditions by:
- proper selection of sources and information derived from them, assessment, critical analysis, synthesis and creative interpretation and presentation of this information, - selection and application of appropriate methods and tools, including advanced information and communication techniques (ICT) (final project with presentation)
K2A_U11- assess the usefulness and possibility of using new achievements (techniques and technologies) in IT systems projects (final project with presentation)

Social competences: a student is prepared to:
K2A_K02 - recognize the importance of knowledge in solving cognitive and practical problems, and seek expert opinions when encountering difficulties in solving the problem (final project with presentation)

Assessment methods and assessment criteria:

Final project with presentation.

The syllabus is effective from the 2020–2021 academic year, and its content is not subject to changes during the semester

Course credits in various terms:

Informatics, full-time master degree studies 3 sem. (InfAAu-SM3)

Type of credits	Number	First term	Last term
European Credit Transfer System (ECTS)	1	2020/2021-Z	