1.	**Field of study**	**Data Science and Artificial Intelligence**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2025/2026 (winter term)
4.	Level of qualifications/degree	first-cycle studies (in engineering)
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Big Data**
Module code	W4_DSAI_S1_DZD
Number of the ECTS credits	4
Language of instruction	Polish
Purpose and description of the content of education	Celem przedmiotu jest zapoznanie studentów z podstawami analizy danych w środowisku dużych zbiorów danych oraz z technikami wykorzystywania języka SQL do wydobywania, przetwarzania i analizowania danych. W ramach kursu uczestnicy nauczą się, jak przechowywać, przetwarzać i analizować dane z wykorzystaniem zarówno klasycznych baz danych, jak i nowoczesnych narzędzi Big Data. W zakresie klasycznych baz danych studenci nabędą wiedzę i umiejętności związane z projektowaniem, tworzeniem i zarządzaniem relacyjnymi bazami danych. Omawiane będą także zagadnienia dotyczące, integralności danych oraz zarządzania transakcjami. Nacisk zostanie położony na praktyczne umiejętności dotyczące tworzenia struktur i manipulowania danymi w postaci znormalizowanej oraz zaawansowane zapytania SQL takie jak złączenia, podzapytania, agregacje.
List of modules that must be completed before starting this module (if necessary)	not applicable

8. Learning outcomes of the module

Code	Description	Learning outcomes of the programme	Level of competenc (scale 1-5)
K01	Student jest świadomy roli danych i ich analizy w podejmowaniu decyzji biznesowych.	DSAI_1S_K03	2
K02	Student jest gotowy do odpowiedzialnego podejścia do bezpieczeństwa i ochrony danych podczas ich przetwarzania i analizy.	DSAI_1S_K03 DSAI_1S_W06	3 2
K03	Student wykazuje postawę otwartości na nowe technologie oraz jest gotowy do ciągłego aktualizowania wiedzy w dynamicznie zmieniającym się obszarze technologii SQL.	DSAI_1S_K01 DSAI_1S_U10	2 3
U01	Student potrafi projektować oraz tworzyć i modyfikować bazy danych za pomocą SQL	DSAI_1S_U02 DSAI_1S_U03	2 2
U02	Student potrafi wyszukiwać, filtrować i agregować dane za pomocą zapytań SQL oraz pisać złożone zapytania obejmujące podzapytania, agregacje i operacje warunkowe.	DSAI_1S_U02 DSAI_1S_U03	2 2
U03	Student umie wykorzystywać narzędzia i technologie bazodanowe w analizie dużych zbiorów danych	DSAI_1S_U02	3

		DSAI_1S_U03	3
W01	Rozumie specyfikę i wyzwania pracy z dużymi zbiorami danych, zna zasady projektowania i tworzenia relacyjnych baz danych.	DSAI_1S_W02 DSAI_1S_W03	3 3
W02	Student zna składnię oraz funkcjonalności języka SQL, w tym zaawansowane operacje na danych (selekcja, filtrowanie, grupowanie, agregacje, złączenia).	DSAI_1S_W02 DSAI_1S_W03	3 2
W03	Student rozumie procesy integracji, transformacji i analizy danych w środowiskach Big Data oraz zna narzędzia wspomagające te procesy.	DSAI_1S_W02 DSAI_1S_W03	3 3

9. Methods of conducting classes

Code	Category	Name (description)
a05	Lecture methods / expository methods	Explanation/clarification *explication involving the derivation of a predetermined theorem from other, already known ones, in the number of steps specified by the person teaching the course*
b04	Problem-solving methods	Activating method – discussion / debate *an exchange of views supported by substantive arguments leading to a clash of different views, a compromise or the identification of common positions; it proceeds according to previously agreed-upon rules regarding the time, manner and turn-taking as well as the principles of civil discourse; a discussion is not a competition but aims at finding the best solutions or presenting different points of view; its varieties include brainstorming, Oxford-style debate, panel discussion, decision tree, conference discussion; a debate is an orderly dispute between supporters and opponents of a viewpoint, usually specialists in the field or pre-selected representatives of a group dealing with a common problem*
b07	Problem-solving methods	Activating methods: a case study *a comprehensive description of a phenomenon connected with the selected discipline; reflecting the reality, presenting the 'what', 'where' and 'how' of the phenomenon, i.e., all of its key aspects to be discussed in class; used as a reproduction, presentation, discussion or diagnosis of factors that shape the phenomenon or interact with it; an in-depth qualitative analysis and evaluation of a selected phenomenon*
b08	Problem-solving methods	Activating method – peer learning *learning through the exchange of knowledge in a group/team/pair of students, i.e., in the so-called learning cell; a kind of mutual learning; an approach focused on student activity under the guidance of the person teaching the course; a learning situation where students with a similar level of experience learn from one another*
c06	Demonstration methods	Demonstration-imitation *a presentation of a model way of performing specific activities accompanied by a commentary; it aims at triggering imitation activities in an individual or in a group of participants observing the activities of the person teaching the course until the right habit is formed through regular exercise; the demonstration-imitation method is combined with a physical practice of activities/behaviours*
c07	Demonstration methods	Screen presentation *a presentation of synthetic image content using computer graphics, e.g., a series of slides or other multimedia forms, usually accompanied by a commentary; typical components of a screen presentation include text organized into bulleted points, charts, images and animations, sometimes sound effects or music; a multimedia illustration of course content presented in the form of a projected image*
d01	Programmed learning methods	Working with a computer *e.g., Webquest; implementation of educational tasks using electronic and digital devices, computer programs and Internet applications; the academic teacher acts as a consultant; students' work is carried out step by step according to the plan laid own by the person teaching the course and following his instructions, and proceeds towards producing the indicated results*

		within the set deadline
d02	Programmed learning methods	Working with a programmed textbook *working with a textbook containing instructional material covering part of or the entire curriculum of the module as well as a formula for studying the content; includes working with a subject textbook, an atlas, a catalogue, a problem book, etc.*
e01	Practical methods	Laboratory exercise / experiment *[also conducted as fieldwork] a method of practical application of knowledge; implemented in three stages: the recognition of a problem induced by the task content, the formulation of the problem and the attempt to solve it accompanied by the assessment of the effects; the goal is to acquire skills, abilities and habits, and to consolidate the acquired knowledge so that it becomes operational; the laboratory method assumes greater independence of learners than carrying out an experiment*
f01	Methods of self-learning	Self-education *a method which involves independent acquisition of knowledge, skills and social competences, extending their scope and quality; complementary to the learning process taking place in class; taking on the task of developing and adjusting qualifications on one's own; self-study*

10. Forms of teaching

Code	Name	Number of hours	Assessment of the learning outcomes of the module	Learning outcomes of the module	Methods of conducting classes
fs01	laboratory classes	45	course work	K01, K02, K03, U01, U02, U03, W01, W02, W03	a05, b04, b07, b08, c06, c07, d01, d02, e01, f01

11. The student's work, apart from participation in classes, includes in particular:

Code	Category	Name (description)	Is it part of the BUNA?
a02	Preparation for classes	Literature reading / analysis of source materials *reading the literature indicated in the syllabus; reviewing, organizing, analyzing and selecting source materials to be used in class*	No
a03	Preparation for classes	Developing practical skills *activities involving the repetition, refinement and consolidation of practical skills, including those developed during previous classes or new skills necessary for the implementation of subsequent elements of the curriculum (as preparation for class participation)*	No
b01	Consulting the curriculum and the organization of classes	Getting acquainted with the syllabus content *reading through the syllabus and getting acquainted with its content*	No
c02	Preparation for verification of learning outcomes	Studying the literature used in and the materials produced in class *exploring the studied content, inquiring, considering, assimilating, interpreting it, or organizing knowledge obtained from the literature, documentation, instructions, scenarios, etc., used in class as well as from the notes or other materials/artifacts made in class*	No
d01	Consulting the results of the verification of learning outcomes	Analysis of the corrective feedback provided by the academic teacher on the results of the verification of learning outcomes *reading through the academic teacher's comments, assessments and opinions on the implementation of the task aimed at checking the level of the achieved learning outcomes*	Yes
d02	Consulting the results of the verification of learning outcomes	Development of a corrective action plan as well as supplementary/corrective tasks *reviewing and selecting tasks and activities enabling the elimination of errors indicated by the academic teacher, their verification or correction resulting in completing the task with at least the minimum passing grade*	Yes

Information on the details of the module implementation in a given academic year can be found in the syllabus available in the USOS system: https://usosweb.us.edu.pl.