

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		Mathematical Analysis 2
Module code		W4_DSAI_S1_AMat2
Number of the ECTS credits		5
Language of instruction		Polish
Purpose and description of the content of education		Moduł jest kontynuacją modułu Analiza matematyczna I. Celem modułu jest dalsze zapoznanie studenta z pojęciami i metodami rachunków różniczkowego i całkowego funkcji wielu zmiennych oraz równań różniczkowych. Treści programowe obejmują również typowe zastosowania metod analizy matematycznej. W czasie zajęć będą poruszane zagadnienia dotyczące m.in. rachunku różniczkowego funkcji wielu zmiennych, ekstremów lokalnych i warunkowych, całek wielokrotnych i ich własności i zastosowań, całek krzywoliniowych i powierzchniowych oraz elementów teorii równań różniczkowych zwyczajnych wraz z przykładami zastosowań do rozwiązywania problemów inżynierijno-technicznych.
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	Dostrzega znaczenie wiedzy matematycznej w rozwiązywaniu problemów poznawczych i praktycznych w obszarze analizy danych i sztucznej inteligencji oraz potrafi rozpoznać potrzebę konsultacji z ekspertami w przypadku trudności z ich samodzielnym rozwiązaniem	DSAI_1S_K01	4	
U01	Rozumie potrzebę ścisłości matematycznej i potrafi przeprowadzać poprawne rozumowania	DSAI_1S_U01	3	
U02	Potrafi rozwiązywać zadania z zakresu analizy matematycznej funkcji wielu zmiennych	DSAI_1S_U01	3	
U03	Potrafi rozwiązywać proste zadania z zakresu równań różniczkowych zwyczajnych	DSAI_1S_U01	3	
W01	Zna podstawowe pojęcia z zakresu analizy matematycznej funkcji wielu zmiennych oraz jej zastosowań	DSAI_1S_W01	3	
W02	Zna elementarne pojęcie z zakresu równań różniczkowych	DSAI_1S_W01	3	
W03	Zna metody związane z zastosowaniem analizy matematycznej i równań różniczkowych do rozwiązywania problemów przyrodniczych i technicznych	DSAI_1S_W01	3	

9. Methods of conducting classes		
Code	Category	Name (description)
a05	Lecture methods / expository methods	Explanation/clarification <i>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</i>
b02	Problem-solving methods	Lecture-discussion <i>transmission of content involving interaction with the lecture audience; discussion of lecture-related issues is one of its elements or constitutes its follow-up</i>
e01	Practical methods	Laboratory exercise / experiment <i>[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</i>

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
fs_01	discussion classes	60	course work	K01, U01, U02, U03, W01, W02, W03	a05, b02, e01

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 <i>reading the literature indicated in the syllabus; reviewing, organizing, analyzing and selecting source materials to be used in class</i>	No
a03	Preparation for classes	Developing practical skills <i>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)</i>	No
b01	Consulting the curriculum and the organization of classes	Getting acquainted with the syllabus content <i>reading through the syllabus and getting acquainted with its content</i>	No
b02	Consulting the curriculum and the organization of classes	Verification / adjustment / discussion of syllabus provisions <i>consulting the content of the syllabus, possibly in the presence of the year tutor or members of the class group, and, if necessary, reassessing the provisions concerning special conditions for class participation, e.g., space and time requirements, technical and other requirements, including conditions for participation in classes outside the walls of the university, classes organized in blocks, organized online, etc.</i>	Yes
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes <i>devising a task implementation strategy embracing the division of content, the range of activities, implementation time and/or the method(s) of obtaining the necessary materials and tools, etc.</i>	Yes
c02	Preparation for verification of learning outcomes	Studying the literature used in and the materials produced in class <i>exploring the studied content, inquiring, considering, assimilating, interpreting it, or organizing</i>	No

		<i>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</i>	
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 <i>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</i>	Yes
d02	Consulting the results of the verification of learning outcomes	Development of a corrective action plan as well as supplementary/corrective tasks <i>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</i>	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>.