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

7.	**General information about the module**
Module name	**Mathematical modelling and computer simulation**
Module code	W4-MT-S2-25-MSKom
Number of the ECTS credits	6
Language of instruction	Polish
Purpose and description of the content of education	The aim of the module is to develop analytical skills, build mathematical models of selected problems and code the developed model in a selected high-level programming language. Intermediate goals are to develop methodological skills (e.g. use of available technology to prepare a project or analysis), develop cognitive skills (e.g. analysis of data/source content provided in the form of articles and textbooks, also in foreign languages), develop skills in interpreting and presenting obtained results and develop teamwork skills (e.g. work in small groups during workshops and outside them).
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)
MSKom_1	potrafi wykorzystać język matematyki do opisu zachowania układu	K_U07	5
MSKom_2	jest gotów do formułowania obiektywnych opinii w zagadnieniach, w których matematyka jest językiem opisu	K_K06	4
MSKom_3	jest gotów do wyszukiwania nowych informacji związanych z danym tematem	K_K02	4
MSKom_4	potrafi przeprowadzić dowody wykorzystując poznane wcześniej wiadomości z algebry i analizy matematycznej	K_U04	3
MSKom_5	zna i rozumie specjalistyczne zagadnienia związane m.in. z analizą matematyczną i algebrą	K_W04	2
MSKom_6	potrafi przeprowadzić symulację komputerową za pomocą wybranego programu - napisać program w wybranym języku programowania wysokiego poziomu.	K_U07	4
MSKom_7	zna zaawansowane techniki obliczeniowe, wspomagające pracę matematyka i rozumie ich ograniczenia	K_W04 K_W05	3 3
MSKom_8	potrafi przeprowadzić prezentację z osiągniętych wyników	K_U09	3

9.	Methods of conducting classes	
Code	**Category**	**Name (description)**
b02	Problem-solving methods	Lecture-discussion *transmission of content involving interaction with the lecture audience; discussion of lecture-related issues is one of its elements or constitutes its follow-up*
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*
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*

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**
MSKom_fs_1	lecture	30	exam	MSKom_1, MSKom_2, MSKom_3, MSKom_4, MSKom_5	b02
MSKom_fs_2	laboratory classes	30	course work	MSKom_1, MSKom_3, MSKom_6, MSKom_7, MSKom_8	b07, d01

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
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)*	Yes
a04	Preparation for classes	Consulting materials complementary to those indicated in the syllabus *agreeing on materials complementary to those indicated in the syllabus, supporting the implementation of tasks resulting from or necessary for class participation*	Yes
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
b02	Consulting the curriculum and the organization of classes	Verification / adjustment / discussion of syllabus provisions *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.*	No
b03	Consulting the curriculum and the organization of classes	Consulting the schedule *getting acquainted with the class schedule, possibly in the presence of the year tutor, in order to*	No

		optimize participation in classes, including those supplementary to the core subjects listed in the pursued study programme	
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*	Yes
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

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.