1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Advanced Programming
Module code		W4-MT-N2-23-PZaw
Number of the ECTS credits		6
Language of instruction		Polish
Purpose and description of the content of education		Wykład przedstawia zaawansowane techniki programowania w jednym z języków wysokiego poziomu (C++, C# lub PYTHON) . Kolejno omawiane będą: obsługa błędów programowanie zorientowane obiektowo praca z plikami serializacja elementy charakterystyczne dla wybranego języka programowania Materiały do zajęć będą się znajdować na platformie e- learningowej.
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)**
PZawN2_1	Student ma uporządkowaną wiedzę w zakresie składni języka wysokiego poziomu potrafi pisać programy przetwarzające pliki oraz komunikujące się poprzez standardowe wejście i wyjście ponadto zna w stopniu podstawowym zasady konstruowania programów wielomodułowych oraz zna podstawowe pojęcia związane z programowaniem obiektowym..		K_K06 K_U07	2 2
PZaw_N2_2	Student potrafi współpracować w zespole pracującym nad różnymi aspektami tego samego projektu, postępuje etycznie wobec innych osób z zespołu. Potrafi integrować wiedzę pochodząca z różnych dyscyplin.		K_K03 K_K07 K_U10	2 2 2

9.	Methods of conducting classes		
Code	**Category**	**Name (description)**	
b01	Problem-solving methods	Problem-based lecture *an analysis of a selected scientific or practical problem accompanied by its assessment and an attempt to provide a solution*	

		to the issues presented in the lecture as well as the indication of the consequences of the proposed solution
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*
b09	Problem-solving methods	Activating method – flipped classroom *anticipatory learning; work in class is based on previously studied material indicated by the person teaching the course; preparation outside the classroom serves the purpose of getting familiar with the issues whose knowledge is necessary for participating in the in-class discussion and the training in the related practical skills; the activity is based on the work of students under the guidance of the person teaching the course*
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*
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*
e07	Practical methods	Simulation *an indirect method; imitating reality in order to gain experience approximating a real one; recreating a real-world situation so that its participant can acquire an experience close to the authentic one; work on "replacement" material*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

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**
PZaw_fs_01	lecture	15	exam	PZawN2_1, PZaw_N2_2	b01
PZaw_fs_02	laboratory classes	30	course work	PZawN2_1, PZaw_N2_2	b07, b08, b09, c07, d01, e01, e07, f02

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	Yes
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)*	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.*	Yes
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
c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/ examination completion *a set of activities aimed at performing an assigned task, to be executed out of class, as an obligatory phase/element of the verification of the learning outcomes assigned to the course*	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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Algebra and Geometry
Module code		W4-MT-N2-23-AGeo
Number of the ECTS credits		6
Language of instruction		Polish
Purpose and description of the content of education		The aim of the course is to familiarize students with the basic notions of algebra and classical geometry, to the extent necessary to teach mathematics in high school and prepare high school students for participation in competitions and subject olympiads. The course includes the following content: 1. Basic algebraic structures: rings and fields, matrix groups. 2. Spaces, subspaces and linear transformations 3. Fundamentals of affine geometry: space, subspace, affine transformations, systems of points. 4. Two- and three-dimensional analytical geometry. 5. Scalar product, bilinear space. isometries.
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)**
AGeo_1		The student knows and understands algebra and geometry sufficiently to teach it in high school.	K_W01 K_W03	2 3
AGeo_2		The student knows the relationship between algebra and geometry. He can use algebraic tools to describe and study objects and geometric transformations.	K_U04 K_U07	2 2
AGeo_3		The student knows the schemes of proofs of key theorems learned during the lecture.	K_U01 K_U03	2 2
AGeo_4		The student is able to explain algebraic and geometric problems to a non-specialist and present their applications	K_U07 K_U09	2 2

9.	Methods of conducting classes		
Code	**Category**	**Name (description)**	
a01	Lecture methods / expository methods	Formal lecture/ course-related lecture *a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided*	
b01	Problem-solving methods	Problem-based lecture *an analysis of a selected scientific or practical problem accompanied by its assessment and an attempt to provide a solution to the issues presented in the lecture as well as the indication of the consequences of the proposed solution*	
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*	

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**
AGeo_fs_1	lecture	15	exam	AGeo_1, AGeo_2, AGeo_3, AGeo_4	a01
AGeo_fs_2	discussion classes	30	course work	AGeo_1, AGeo_2, AGeo_3, AGeo_4	b01, b08

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	No
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
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.*	Yes
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 optimize participation in classes, including those supplementary to the core subjects listed in the*	Yes

		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*	No
c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/ examination completion *a set of activities aimed at performing an assigned task, to be executed out of class, as an obligatory phase/element of the verification of the learning outcomes assigned to the course*	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
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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		**Algorithms and data structures**
Module code		W4-MT-N2-23-AiSD
Number of the ECTS credits		5
Language of instruction		Polish
Purpose and description of the content of education		Celem modułu jest zapoznanie studentów z wybranymi strukturami danych oraz omówienie wybranych algorytmów i metod konstruowania algorytmów. W trakcie laboratoriów, które będą odbywały się w pracowni komputerowej, studenci będą mieli możliwość napisania programów wykorzystujących omawiany materiał. Natomiast w trakcie konwersatoriów, odbywających się w klasycznej sali tablicowej, będzie możliwość głębszego i teoretycznego omówienia stosownego materiału. 1. Typy złożoności: pesymistyczna, optymistyczna i średnia. 2. Rozwiązywanie równań rekurencyjnych na potrzeby analizy algorytmów rekurencyjnych. Twierdzenie o rekurencji uniwersalnej. 3. Omówienie wybranych problemów i algorytmów w tym m.in. tych wymienionych w podstawie programowej kształcenia ogólnego przedmiotu Informatyka w szkole ponadpodstawowej. 4. Abstrakcyjne struktury danych: stosy, kolejki, kolejki priorytetowe, słowniki. Metody implementacji powyższych struktur (tablice, listy dowiązane, kopce binarne, drzewa, drzewa poszukiwań binarnych) i ich zastosowania (np. do zamiany klasycznego wyrażenia na postać w odwrotnej notacji polskiej i obliczanie jego wartości na podstawie tej postaci). 5. Wybrane algorytmy grafowe. 6. Model drzew decyzyjnych i twierdzenie o dolnym ograniczeniu na czas działania algorytmów sortujących za pomocą porównań. Sortowanie w czasie liniowym.
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)**
AiSD_1	zna i zapisuje klasyczne algorytmy, w postaci iteracyjnej oraz rekurencyjnej, za pomocą listy kroków, schematu blokowego lub pseudokodu oraz implementuje je wybranym języku programowania; zna i omawia sytuacje, w których wykorzystuje się klasyczne algorytmy	K_U07 K_W04	3 2
AiSD_2	zna podstawowe własności algorytmów; prezentuje przykłady zastosowań algorytmiki w innych dziedzinach nauki	K_W04	2
AiSD_3	zna i rozumie pojęcie złożoności obliczeniowej (czasowej i pamięciowej) oraz notacji asymptotycznej	K_W04	3
AiSD_4	porównuje działanie różnych algorytmów dla wybranego problemu, analizuje algorytmy na podstawie ich gotowych	K_U07	2

	implementacji		
AiSD_5	zna podstawowe abstrakcyjne typy danych (stos, kolejka, kolejka priorytetowa, słownik) i ich realizacje komputerowe (listy, tablice, kopce binarne, drzewa, drzewa poszukiwań binarnych); potrafi konstruować proste algorytmy z wykorzystaniem poznanych struktur danych	K_U07 K_W04	2 3
AiSD_6	dostrzega związek pomiędzy czasem działaniem programu komputerowego a doborem różnych struktur danych i algorytmów w jego implementacji; do realizacji rozwiązania problemu dobiera odpowiednią metodę lub technikę algorytmiczną i struktury danych	K_U07	2
AiSD_7	projektuje i tworzy rozbudowane programy w procesie rozwiązywania problemów, wykorzystuje w programach dobrane do algorytmów struktury danych, w tym struktury dynamiczne i korzysta z dostępnych bibliotek dla tych struktur	K_U07	2

9.	Methods of conducting classes	
Code	**Category**	**Name (description)**
a01	Lecture methods / expository methods	Formal lecture/ course-related lecture *a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided*
a03	Lecture methods / expository methods	Description *a description of objects, phenomena, processes or people; it involves specifying the structure and characteristic features of the object, phenomenon, or process being described; it is usually accompanied by a demonstration of the described object or by its models, drawings, tables, charts, etc.; a description may take the form of an explanation, classification, justification or comparison*
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*
b09	Problem-solving methods	Activating method – flipped classroom *anticipatory learning; work in class is based on previously studied material indicated by the person teaching the course; preparation outside the classroom serves the purpose of getting familiar with the issues whose knowledge is necessary for participating in the in-class discussion and the training in the related practical skills; the activity is based on the work of students under the guidance of the person teaching the course*
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*
d03	Programmed learning methods	Working with another teaching tool *e.g. using websites in any way or according to the rules set by the teacher; or making use of other subject-specific tools*
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
f02	Methods of self-learning	Individual work with a text searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue

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**	
AiSD_fpz1	lecture	15	exam	AiSD_1, AiSD_2, AiSD_3, AiSD_5	a01, a03, c07	
AiSD_fpz_2	laboratory classes	15	course work	AiSD_1, AiSD_2, AiSD_3, AiSD_4, AiSD_5, AiSD_6, AiSD_7	b08, b09, d01, e01, f02	
AiSD_fpz_3	discussion classes	15	course work	AiSD_1, AiSD_2, AiSD_3, AiSD_4, AiSD_5, AiSD_6, AiSD_7	b08, b09, d03, f02	

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes	No
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
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.	Yes
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 optimize participation in classes, including those supplementary to the core subjects listed in the pursued study programme	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
c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/examination completion *a set of activities aimed at performing an assigned task, to be executed out of class, as an obligatory phase/element of the verification of the learning outcomes assigned to the course*	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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Applications of GeoGebra in teaching mathematics
Module code		W4-MT-N2-23-ZGeog
Number of the ECTS credits		2
Language of instruction		Polish
Purpose and description of the content of education		Przedmiot ma na celu pogłębienie wiedzy przedmiotowej studentów poprzez powiązanie znanych im treści przedmiotowych z zakresu szkoły ponadpodstawowej z analizą dostępnych i przygotowaniem własnych materiałów dydaktycznych mogących wspomóc proces nauczania matematyki na trzecim etapie edukacyjnym, a także przygotowania ich do wykorzystania GeoGebry w pracy dydaktycznej jako narzędzia wspomagającego rozwijanie myślenia komputacyjnego w rozwiązywaniu problemów otwartych.
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)
ZGeog_01	student ma pogłębioną i rozszerzoną wiedzę w zakresie nauczanego przedmiotu (pełne pięcioletnie wykształcenie kierunkowe) i umiejętność jej popularyzacji, a także elementaryzacji	KN.2023_U02 KN.2023_U07	4 3
ZGeog_02	student ma kompetencje niezbędne do ciągłego doskonalenia jakości swojej pracy, skutecznie korzystając z technologii informacyjno–komunikacyjnych	KN.2023_U02	3
ZGeog_03	student jest przygotowany do skutecznego i efektywnego realizowania zadań zawodowych (dydaktycznych, wychowawczych i opiekuńczych) wynikających z roli nauczyciela	KN.2023_KS06 KN.2023_U07 KN.2023_U18	3 3 4

9.	Methods of conducting classes		

Code	Category	Name (description)
a03	Lecture methods / expository methods	Description *a description of objects, phenomena, processes or people; it involves specifying the structure and characteristic features of the object, phenomenon, or process being described; it is usually accompanied by a demonstration of the described object or by its models, drawings, tables, charts, etc.; a description may take the form of an explanation, classification, justification or comparison*

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*
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*
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*
d03	Programmed learning methods	Working with another teaching tool *e.g. using websites in any way or according to the rules set by the teacher; or making use of other subject-specific tools*
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*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

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
01	laboratory classes	15	course work	ZGeog_01, ZGeog_02, ZGeog_03	a03, b02, b08, d01, d03, e01, f02

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

Code	Category	Name (description)	Is it part of the BUNA?
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	Yes
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
a05	Preparation for classes	Production/preparation of tools, materials or documentation necessary for class participation *developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes*	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.*	Yes
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	Yes
c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/ examination completion *a set of activities aimed at performing an assigned task, to be executed out of class, as an obligatory phase/element of the verification of the learning outcomes assigned to the course*	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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Complex Analysis
Module code		W4-MT-N2-23-AZes
Number of the ECTS credits		6
Language of instruction		Polish
Purpose and description of the content of education		Moduł obejmuje wykłady i ćwiczenia konwersatoryjne w zakresie zagadnień analizy zespolonej, leżącej u podstaw klasycznego wykształcenia matematycznego. Ramowy zakres modułu obejmuje następujące tematy: 1. Liczby zespolone. Płaszczyzna domknięta. Granica, ciągłość, pochodna funkcji zespolonej; równania Cauchy'ego-Riemanna. Elementarne funkcje zespolone. 2. Całka funkcji zespolonej; całka krzywoliniowa. Funkcja pierwotna. Indeks. 3. Funkcje holomorficzne. Wzór całkowy Cauchy'ego; twierdzenie Cauchy'ego. 4. Niemal jednostajna granica funkcji holomorficznych; twierdzenie Weierstrassa. Szeregi potęgowe. Szeregi Laurenta. 5. Punkty osobliwe odosobnione. 6. Twierdzenie o residuach.
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)
AZes_1	prezentuje gotowość do studiowania zagadnień i rozwiązywania zadań w ramach realizowanego modułu	K_K01	5
AZes_2	prezentuje aktywność w dyskusji pojęć i faktów analizy zespolonej oraz w dążeniu do ich precyzyjnego formułowania i uzasadniania	K_K02 K_K05	4 4
AZes_3	potrafi efektywnie wyrażać studiowane treści analizy zespolonej	K_U02	3
AZes_4	zna podstawowe pojęcia i narzędzia analizy zespolonej	K_W01	3
AZes_5	zna podstawowe twierdzenia obejmowane modułem	K_W03	3
AZes_6	potrafi konstruować rozumowania by przeprowadzać dowody wybranych twierdzeń analizy zespolonej	K_U01 K_W02	3 3

9.	Methods of conducting classes		
Code	**Category**	**Name (description)**	
a01	Lecture methods / expository methods	Formal lecture/ course-related lecture *a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided*	
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*	
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*	

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**
AZes_fns_1	lecture	15	exam	AZes_3, AZes_4, AZes_5, AZes_6	a01
AZes_fns_2	discussion classes	30	course work	AZes_1, AZes_2, AZes_3, AZes_4, AZes_5	b08, 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 *reading the literature indicated in the syllabus; reviewing, organizing, analyzing and selecting source materials to be used in class*	Yes
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
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 optimize participation in classes, including those supplementary to the core subjects listed in the*	No

		pursued study programme	
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	No

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Computational Mathematics
Module code		W4-MT-N2-23-MObl
Number of the ECTS credits		3
Language of instruction		Polish
Purpose and description of the content of education		Celem przedmiotu jest pogłębione zapoznanie studentów z algorytmami i strukturami danych używanymi w matematyce obliczeniowej. Oś przedmiotu jest paralelna do kursowego wykładu "Wstęp do matematyki obliczeniowej" odbywającego się na studiach 1. stopania, jednakże celem bieżącego kursu jest przedstawienie studentom bardziej zaawansowanych metod obliczeniowych. Program wykładu obejmuje następujące zagadnienia: - szybka transformata Fouriera i jej zastosowania, w tym szybkie algorytmy mnożenia za pomocą FFT; - rozkład bezkwadratowy i jego zastosowania do rozkładu funkcji wymiernych na ułamki proste oraz całkowania symbolicznego funkcji wymiernych; - zaawansowane algorytmy rozwiązywania równań wielomianowych jednej zmiennej; - porządki jednomianowe, bazy Gröbnera, rozwiązywanie układów równań wielomianowych wielu zmiennych za pomocą baz Gröbnera, inne zastosowania baz Gröbnera.
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)
MObl_1	Student potrafi zastosować wybrany system CAS rozwiązywania problemów z różnych działów matematyki.	K_U07	1
MObl_2	Student zna podstawowe i zaawansowane algorytmy używane do rozwiązywania równań wielomianowych jednej zmiennej a także układów równań wielomianowych wielu zmiennych.	K_U07 K_W04 K_W05	1 1 1
MObl_3	Student zna zasady działania programów matematycznych oraz ich ograniczenia.	K_W01	1
MObl_4	Student potrafi zastosować rozkład bezkwadratowy wielomianu do symbolicznego obliczania całek z funkcji wymiernych.	K_W01 K_W04 K_W05	1 1 1

| MObl_5 | Student zna wybrane zastosowania baz Gröbnera. | K_W04 | 1 |
| | | K_W05 | 1 |

9.	Methods of conducting classes		

Code	Category	Name (description)
a01	Lecture methods / expository methods	**Formal lecture/ course-related lecture** *a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided*
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*
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*
e04	Practical methods	**Project scheduling** *proceeding according to the steps proposed within a specific methodology for the completion of a task; e.g., identifying project objectives, determining the result, identifying strengths, limitations, opportunities and threats (SWOT), establishing a schedule of activities, assessing resources, establishing an implementation plan; the initial diagnosis; the reassessment of assumptions; the process of preparing the practical implementation of a project*

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
MObl_fns_1	lecture	15	course work	MObl_1, MObl_2, MObl_3, MObl_4, MObl_5	a01, a05
MObl_fns_2	laboratory classes	15	course work	MObl_1, MObl_2, MObl_3, MObl_4, MObl_5	d01, e04

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

Code	Category	Name (description)	Is it part of the BUNA?
a01	Preparation for classes	**Search for materials and review activities necessary for class participation** *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	No
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*	Yes
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
a05	Preparation for classes	Production/preparation of tools, materials or documentation necessary for class participation	Yes

		developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes	
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
c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/ examination completion *a set of activities aimed at performing an assigned task, to be executed out of class, as an obligatory phase/element of the verification of the learning outcomes assigned to the course*	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*	No

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Continuous Didactic Practicium in Mathematics
Module code		W4-MT-N2-23-PDCzMat
Number of the ECTS credits		2
Language of instruction		Polish
Purpose and description of the content of education		Celem praktyki nauczycielskiej jest zdobywanie przez studenta doświadczenia związanego z pracą dydaktyczno-wychowawczą nauczyciela i konfrontowanie nabytej wiedzy z zakresu dydaktyki matematyki z rzeczywistością pedagogiczną.
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)**
PDCzMat_01	student na i rozumie zadania dydaktyczne realizowane przez szkołę lub placówkę systemu oświaty		KN.2023_W01	4
			KN.2023_W08	4
			KN.2023_W09	4
PDCzMat_02	student zna i rozumie sposób funkcjonowania oraz organizację pracy dydaktycznej szkoły lub placówki systemu oświaty		KN.2023_W08	4
			KN.2023_W11	4
PDCzMat_03	student zna rodzaje dokumentacji działalności dydaktycznej prowadzonej w szkole lub placówce systemu oświaty		KN.2023_W08	4
			KN.2023_W09	4
PDCzMat_04	student potrafi wyciągnąć wnioski z obserwacji pracy dydaktycznej nauczyciela, jego interakcji z uczniami oraz sposobu planowania i przeprowadzania zajęć dydaktycznych; aktywnie obserwować stosowane przez nauczyciela metody i formy pracy oraz wykorzystywane pomoce dydaktyczne, a także sposoby oceniania uczniów oraz zadawania i sprawdzania pracy domowej		KN.2023_U01	4
			KN.2023_U02	4
			KN.2023_U10	4
			KN.2023_U12	4
PDCzMat_05	Student potrafi zaplanować i przeprowadzić pod nadzorem opiekuna praktyk zawodowych serię lekcji lub zajęć.		KN.2023_U01	4
			KN.2023_U02	4
			KN.2023_U03	4
			KN.2023_U06	4

			KN.2023_U07	4
			KN.2023_U08	4
			KN.2023_U09	3
			KN.2023_U12	4
PDCzMat_06	Student jest gotów do skutecznego współdziałania z opiekunem praktyk zawodowych i nauczycielami w celu poszerzania swojej wiedzy dydaktycznej oraz rozwijania umiejętności wychowawczych.		KN.2023_KS07	4
			KN.2023_U01	4

9.	Methods of conducting classes		
Code	**Category**		**Name (description)**
e05	Practical methods		Internship *including professional and individual training; gaining skills and experience in real-life conditions, e.g., in the environment, institution or workplace the student is preparing for by following a specific study programme; training in real working conditions*
e06	Practical methods		Observation *also conducted as fieldwork; a method of watching phenomena, objects or people in a systematic/planned way in order to gain knowledge about them; perceptual separation of elements of a model action as an element of learning through imitation; a complex system of cognition based on sensory experiences*
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**
01	internship	30	course work	PDCzMat_01, PDCzMat_02, PDCzMat_03, PDCzMat_04, PDCzMat_05, PDCzMat_06	e05, e06, 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
a05	Preparation for classes	Production/preparation of tools, materials or documentation necessary for class participation *developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes*	Yes
b01	Consulting the curriculum and the organization	Getting acquainted with the syllabus content	Yes

	of classes	reading through the syllabus and getting acquainted with its content	
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.*	Yes
d03	Consulting the results of the verification of learning outcomes	Review of internship documentation *an analysis of the portfolio of documentation obtained during internship, including professional internship, and other practical classes and studio sessions, as well as the documentation developed in order to obtain credit for such classes; verification of the description, necessary attachments, opinions and grades before submitting the portfolio for acceptance*	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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		**Database systems**
Module code		W4-MT-N2-23-BDan
Number of the ECTS credits		4
Language of instruction		Polish
Purpose and description of the content of education		Wprowadzenie do problematyki systemów baz danych: pojęcie bazy danych i systemu zarządzania bazą danych. Użytkownicy, architektura i zalety stosowania systemów baz danych. Modelowanie danych: model związków encji (entity relationship – E/R) jako jeden z fundamentalnych modeli wykorzystywanych przy projektowaniu baz danych. Relacyjny model danych i algebra relacji: atrybuty, dziedziny atrybutów, krotki i relacje; operacje na relacjach, integralność danych (klucze, klucze obce). Zależności funkcyjne. Rozkład bez straty danych i bez straty zależności funkcyjnych. Postacie normalne. SQL jako standardowy język systemów relacyjnych. Kwerendy wybierające, selekcja, sortowanie, grupowanie, funkcje agregujące DML - usuwanie, aktualizacja i dołączanie danych DDL - Operacje na strukturach. Indeksy – poprawianie czasu wykonania zapytania. Transakcje. Motywacja i własności (ACID). Przetwarzanie transakcji, blokady i poziomy izolacji. PL/SQL – język programowania baz danych. Projektowanie relacyjnych baz danych, architektura klient-serwer. system zabezpieczeń (administrowanie bazą danych, wielodostępność bazy danych).
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)**
BDan_1		Znajomość systemów bazodanowych, rozumienie ich roli oraz zasad funkcjonowania Rozumienie podstawowych koncepcji baz danych. Umiejętność posługiwania się językiem zapytań i rozumienie znaczenia głównych klauzul w poleceniach SQL. Umiejętność weryfikacji błędów składniowych i interpretacji odpowiedzi uzyskiwanych z bazy danych.	K_K06 K_U07	2 3
BDan_2		Umiejętność projektowania i zarządzania bazami danych	K_K06	2

	Umiejętność tworzenia, modyfikacji i usuwania podstawowych struktur bazodanowych, a także manipulowania danymi. Rozumienie pojęcia trwałości danych, umiejętność zatwierdzania i wycofywania zmian i świadomość konsekwencji wielodostępu do danych. Umiejętność egzekwowania spójności danych poprzez użycie więzów klucza głównego, więzów kluczy obcych, unikatowych i kontrolnych. Znajomość zastosowań perspektyw prostych i złożonych.	K_U07	3
BDan_3	Umiejętność pisania programów w wybranym języku programowania wysokiego poziomu Znajomość języka programowania bazy danych PL/SQL Umiejętność tworzenia wyzwalaczy, funkcji, procedur, pakietów bazodanowych	K_K01 K_U07	3 4
BDan_4	Umiejętność współpracy w grupie oraz organizowania pracy grupy podczas realizacji wspólnych projektów informatycznych Umiejętność zespołowego tworzenia projektu bazodanowego	K_K04 K_U09 K_U10	3 2 4

9.	Methods of conducting classes		
Code	**Category**		**Name (description)**
a01	Lecture methods / expository methods		Formal lecture/ course-related lecture *a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided*
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**
BDan_fns_1	lecture	15	course work	BDan_1, BDan_2, BDan_3	a01
BDan_fns_2	laboratory classes	15	course work	BDan_1, BDan_2, BDan_3, BDan_4	d01

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*	Yes

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
c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/ examination completion *a set of activities aimed at performing an assigned task, to be executed out of class, as an obligatory phase/element of the verification of the learning outcomes assigned to the course*	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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Didactics of Mathematics I
Module code		W4-MT-N2-23-DMat1
Number of the ECTS credits		2
Language of instruction		Polish
Purpose and description of the content of education		Dydaktyka matematyki - szkoła ponadpodstawowa I obejmuje przygotowanie w zakresie dydaktyki (metodyki nauczania) matematyki w szkołach ponadpodstawowych (np. liceum, technikum) w zakresie: Miejsce matematyki w ramowym planie nauczania na etapie szkoły ponadpodstawowej. Podstawa programowa kształcenia ogólnego z matematyki. Cele kształcenia i treści nauczania matematyki na etapie szkoły ponadpodstawowej. Projektowanie procesu kształcenia. Program nauczania – tworzenie i modyfikacja, analiza, ocena, dobór i zatwierdzanie. Rozkładu materiału. Integracja wewnątrz- i międzyprzedmiotowa. Zagadnienie nauczania interdyscyplinarnego. Konwencjonalne i niekonwencjonalne metody nauczania, w tym metody aktywizujące i metoda projektów, uczenie się przez działanie, odkrywanie lub dociekanie naukowe oraz pracę badawczą ucznia. Zasady doboru metod nauczania typowych dla danego przedmiotu lub rodzaju zajęć. Sposoby organizowania przestrzeni klasy szkolnej, z uwzględnieniem zasad projektowania uniwersalnego. Środki dydaktyczne i pomoce dydaktyczne – dobór i wykorzystanie. Organizacja pracy w klasie szkolnej i grupach. Formy pracy specyficzne dla matematyki. Właściwe wykorzystanie czasu lekcji przez ucznia i nauczyciela. Wyszukiwanie, adaptacja i tworzenie elektronicznych zasobów edukacyjnych i projektowanie multimediów.
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)**
DMat1_01		Student zna i rozumie miejsce danego przedmiotu lub rodzaju zajęć w ramowych planach nauczania na poszczególnych etapach edukacyjnych.	KN.2023_U04	3
			KN.2023_U05	3
			KN.2023_W07	3
DMat1_02		Student zna i rozumie kompetencje merytoryczne, dydaktyczne i wychowawcze nauczyciela, w tym potrzebę zawodowego rozwoju, także z wykorzystaniem technologii informacyjnokomunikacyjnej, oraz dostosowywania sposobu komunikowania się do poziomu rozwoju uczniów i stymulowania aktywności poznawczej uczniów, w tym kreowania sytuacji dydaktycznych; znaczenie autorytetu nauczyciela oraz zasady interakcji ucznia i nauczyciela w toku lekcji; moderowanie interakcji między uczniami; rolę nauczyciela jako popularyzatora wiedzy oraz znaczenie współpracy nauczyciela w procesie dydaktycznym z rodzicami lub opiekunami uczniów, pracownikami szkoły i środowiskiem pozaszkolnym.	KN.2023_KS01	4
			KN.2023_U09	4
			KN.2023_U13	4
			KN.2023_W01	4
			KN.2023_W06	3
			KN.2023_W12	2

DMat1_03	Student zna i rozumie integrację wewnątrz- i międzyprzedmiotową; zagadnienia związane z programem nauczania – tworzenie i modyfikację, analizę, ocenę, dobór i zatwierdzanie oraz zasady projektowania procesu kształcenia oraz rozkładu materiału.	KN.2023_KS04 KN.2023_U11 KN.2023_W02 KN.2023_W04 KN.2023_W05	3 3 2 3 3
DMat1_04	Student zna i rozumie metodykę realizacji poszczególnych treści kształcenia w obrębie przedmiotu lub zajęć – rozwiązania merytoryczne i metodyczne, dobre praktyki, dostosowanie oddziaływań do potrzeb i możliwości uczniów lub grup uczniowskich o różnym potencjale i stylu uczenia się, typowe dla przedmiotu lub rodzaju zajęć błędy uczniowskie, ich rolę i sposoby wykorzystania w procesie dydaktycznym.	KN.2023_KS06 KN.2023_U12 KN.2023_W03 KN.2023_W14	3 3 3 3
DMat1_05	Student zna i rozumie organizację pracy w klasie szkolnej i grupach: potrzebę indywidualizacji nauczania, zagadnienie nauczania interdyscyplinarnego, formy pracy specyficzne dla danego przedmiotu lub rodzaju zajęć: wycieczki, zajęcia terenowe i laboratoryjne, doświadczenia i konkursy oraz zagadnienia związane z pracą domową.	KN.2023_KS05 KN.2023_U01 KN.2023_U07 KN.2023_U13 KN.2023_W12	3 3 3 3 3
DMat1_06	Student zna i rozumie sposoby organizowania przestrzeni klasy szkolnej, z uwzględnieniem zasad projektowania uniwersalnego: środki dydaktyczne (podręczniki i pakiety edukacyjne), pomoce dydaktyczne – dobór i wykorzystanie zasobów edukacyjnych, w tym elektronicznych i obcojęzycznych, edukacyjne zastosowania mediów i technologii informacyjno-komunikacyjnej; myślenie komputacyjne w rozwiązywaniu problemów w zakresie nauczanego przedmiotu lub prowadzonych zajęć; potrzebę wyszukiwania, adaptacji i tworzenia elektronicznych zasobów edukacyjnych i projektowania multimediów.	KN.2023_U01 KN.2023_U14 KN.2023_W04 KN.2023_W15	3 3 3 3
DMat1_07	Student zna i rozumie znaczenie rozwijania umiejętności osobistych i społeczno-emocjonalnych uczniów: potrzebę kształtowania umiejętności współpracy uczniów, w tym grupowego rozwiązywania problemów oraz budowania systemu wartości i rozwijania postaw etycznych uczniów, a także kształtowania kompetencji komunikacyjnych i nawyków kulturalnych.	KN.2023_KS04 KN.2023_KS07 KN.2023_U09 KN.2023_W06 KN.2023_W10	3 3 3 3 3
DMat1_08	Student potrafi identyfikować typowe zadania szkolne z celami kształcenia, w szczególności z wymaganiami ogólnymi podstawy programowej, oraz z kompetencjami kluczowymi.	KN.2023_KS01 KN.2023_U05 KN.2023_U13 KN.2023_W09	3 3 3 3
DMat1_09	Student potrafi przeanalizować rozkład materiału.	KN.2023_U04 KN.2023_U18 KN.2023_W08 KN.2023_W14	3 3 3 3
DMat1_10	Student potrafi identyfikować powiązania treści nauczanego przedmiotu lub prowadzonych zajęć z innymi treściami nauczania.	KN.2023_KS03 KN.2023_KS06 KN.2023_KS07	3 3 3

			KN.2023_W03	3
			KN.2023_W07	3
DMat1_11	Student potrafi dobierać metody pracy klasy oraz środki dydaktyczne, w tym z zakresu technologii informacyjno-komunikacyjnej, aktywizujące uczniów i uwzględniające ich zróżnicowane potrzeby edukacyjne.		KN.2023_U02	3
			KN.2023_U03	3
			KN.2023_U12	3
			KN.2023_U15	3
			KN.2023_W06	3
			KN.2023_W15	3
DMat1_12	Student jest gotów do adaptowania metod pracy do potrzeb i różnych stylów uczenia się uczniów.		KN.2023_KS02	2
			KN.2023_U01	2
			KN.2023_W01	2
DMat1_13	Student jest gotów do zachęcania uczniów do podejmowania prób badawczych oraz systematycznej aktywności fizyczne.		KN.2023_U14	2
			KN.2023_W11	2
DMat1_14	Student jest gotów do rozwijania u uczniów ciekawości, aktywności i samodzielności poznawczej oraz logicznego i krytycznego myślenia.		KN.2023_U06	2
			KN.2023_U07	2
			KN.2023_U08	2

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*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

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**
DMat1_01	discussion classes		30	course work	DMat1_01, DMat1_02, DMat1_03, DMat1_04, DMat1_05, DMat1_06, DMat1_07, DMat1_08, DMat1_09, DMat1_10, DMat1_11, DMat1_12, DMat1_13, DMat1_14	b02, f02

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	Yes
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)*	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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Didactics of Mathematics II
Module code		W4-MT-N2-23-DMat2
Number of the ECTS credits		2
Language of instruction		Polish
Purpose and description of the content of education		Dydaktyka matematyki, jako nauka ogniskuje swoje zainteresowania na szeroko pojętym procesie uczenia się – nauczania matematyki, na jego uwarunkowaniach, przebiegu, regułach, którym podlega oraz na sposobach i możliwości jego kształtowania przez człowieka. Celem przedmiotu jest zintegrowanie dla potrzeb studenta wiedzy z różnych dyscyplin (jak dydaktyka ogólna, psychologia, pedagogika, a przede wszystkim - matematyka) tak, aby ułatwić mu zrozumienie tego procesu w stopniu umożliwiającym samodzielne jego kreowanie jako nauczyciela na trzecim etapie edukacyjnym. Dydaktyka matematyki II obejmuje drugą część niezbędnych do tego zagadnień i problemów.
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)
DMat2_01	Student zna i rozumie kompetencje merytoryczne, dydaktyczne i wychowawcze nauczyciela, w tym potrzebę zawodowego rozwoju, także z wykorzystaniem technologii informacyjno-komunikacyjnej, oraz dostosowywania sposobu komunikowania się do poziomu rozwoju uczniów i stymulowania aktywności poznawczej uczniów, w tym kreowania sytuacji dydaktycznych; znaczenie autorytetu nauczyciela oraz zasady interakcji ucznia i nauczyciela w toku lekcji; moderowanie interakcji między uczniami; rolę nauczyciela jako popularyzatora wiedzy oraz znaczenie współpracy nauczyciela w procesie dydaktycznym z rodzicami lub opiekunami uczniów, pracownikami szkoły i środowiskiem pozaszkolnym.	KN.2023_KS01 KN.2023_U09 KN.2023_U13 KN.2023_W01 KN.2023_W06 KN.2023_W12	4 4 4 4 4 4
DMat2_02	Student zna i rozumie konwencjonalne i niekonwencjonalne metody nauczania, w tym metody aktywizujące i metodę projektów, proces uczenia się przez działanie, odkrywanie lub dociekanie naukowe oraz pracę badawczą ucznia, a także zasady doboru metod nauczania typowych dla danego przedmiotu lub rodzaju zajęć.	KN.2023_KS02 KN.2023_U08 KN.2023_U10 KN.2023_W04 KN.2023_W12 KN.2023_W14	4 4 4 4 4 4
DMat2_03	Student zna i rozumie egzaminy kończące etap edukacyjny i sposoby konstruowania testów, sprawdzianów oraz innych	KN.2023_U11	4

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		KN.2023_U12	4
		KN.2023_W03	4
		KN.2023_W07	4
DMat2_04	Student zna i rozumie warsztat pracy nauczyciela; właściwe wykorzystanie czasu lekcji przez ucznia i nauczyciela; zagadnienia związane ze sprawdzaniem i ocenianiem jakości kształcenia oraz jej ewaluacją, a także z koniecznością analizy i oceny własnej pracy dydaktyczno-wychowawczej.	KN.2023_KS07	3
		KN.2023_U01	3
		KN.2023_U13	3
		KN.2023_W03	3
		KN.2023_W05	3
DMat2_05	Student zna i rozumie potrzebę kształtowania u ucznia pozytywnego stosunku do nauki, rozwijania ciekawości, aktywności i samodzielności poznawczej, logicznego i krytycznego myślenia, kształtowania motywacji do uczenia się danego przedmiotu i nawyków systematycznego uczenia się, korzystania z różnych źródeł wiedzy, w tym z Internetu, oraz przygotowania ucznia do uczenia się przez całe życie przez stymulowanie go do samodzielnej pracy.	KN.2023_KS01	3
		KN.2023_KS06	3
		KN.2023_U02	3
		KN.2023_U05	3
		KN.2023_W02	3
DMat2_06	Student potrafi dostosować sposób komunikacji do poziomu rozwojowego uczniów.	KN.2023_KS03	3
		KN.2023_U03	3
		KN.2023_U12	3
		KN.2023_U15	3
		KN.2023_W12	3
DMat2_07	Student potrafi kreować sytuacje dydaktyczne służące aktywności i rozwojowi zainteresowań uczniów oraz popularyzacji wiedzy.	KN.2023_U06	3
		KN.2023_U07	3
		KN.2023_U14	3
DMat2_08	Student potrafi podejmować skuteczną współpracę w procesie dydaktycznym z rodzicami lub opiekunami uczniów, pracownikami szkoły i środowiskiem pozaszkolnym.	KN.2023_KS07	3
		KN.2023_U05	3
		KN.2023_U14	3
		KN.2023_W03	3
		KN.2023_W12	3
DMat2_09	Student potrafi rozpoznać typowe dla nauczanego przedmiotu lub prowadzonych zajęć błędy uczniowskie i wykorzystać je w procesie dydaktycznym.	KN.2023_U01	2
		KN.2023_U06	2
		KN.2023_U08	2
		KN.2023_W14	2
DMat2_10	Student jest gotów do budowania systemu wartości i rozwijania postaw etycznych uczniów oraz kształtowania ich kompetencji komunikacyjnych i nawyków kulturalnych.	KN.2023_KS01	2
		KN.2023_KS02	2
		KN.2023_W01	2
DMat2_11	Student jest gotów do promowania odpowiedzialnego i krytycznego wykorzystywania mediów cyfrowych oraz poszanowania praw własności intelektualnej.	KN.2023_KS01	2

		KN.2023_KS03	2
		KN.2023_KS06	2
		KN.2023_U02	2
		KN.2023_W12	2
DMat2_12	Student jest gotów do kształtowania umiejętności współpracy uczniów, w tym grupowego rozwiązywania problemów.	KN.2023_KS01	2
		KN.2023_U01	2
		KN.2023_U02	2
		KN.2023_W04	2
		KN.2023_W15	2
DMat2_13	Student jest gotów do kształtowania nawyku systematycznego uczenia się i korzystania z różnych źródeł wiedzy, w tym z Internetu.	KN.2023_KS02	2
		KN.2023_U02	2
		KN.2023_W10	2
DMat2_14	Student jest gotów do stymulowania uczniów do uczenia się przez całe życie przez samodzielną pracę.	KN.2023_KS06	2
		KN.2023_W02	2

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*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

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**
DMat2_01	discussion classes	30	course work	DMat2_01, DMat2_02, DMat2_03, DMat2_04, DMat2_05, DMat2_06, DMat2_07, DMat2_08, DMat2_09, DMat2_10, DMat2_11, DMat2_12, DMat2_13, DMat2_14	b02, f02

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation	Yes

		reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes	
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*	Yes
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

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Differential Equations
Module code		W4-MT-N2-23-RRoz
Number of the ECTS credits		6
Language of instruction		Polish
Purpose and description of the content of education		1. Metoda kolejnych przybliżeń i twierdzenie Picarda o istnieniu i jednoznaczności rozwiązań zadania Cauchy'ego. 2. Istnienie rozwiązań równań różniczkowych o ciągłej prawej stronie; twierdzenie Peano. 3. Analityczne rozwiązania równań różniczkowych zwyczajnych; twierdzenie Cauchy'ego. 4. Wybrane narzędzia teorii równań różniczkowych cząstkowych. Transformacja Fouriera, lemat Laxa-Milgrama. 5. Elementy teorii przestrzeni Sobolewa. 6. Słabe rozwiązania równań eliptycznych. 7. Metody przybliżone/numeryczne rozwiązywania równań różniczkowych cząstkowych.
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)
RRoz_1	Zna i rozumie klasyczną wiedzę z zakresu równań różniczkowych zwyczajnych i cząstkowych.	K_W01	3
RRoz_2	Zna i rozumie twierdzenia; Picarda, Peano, Cauchy'ego, oraz podstawy teorii równań różniczkowych cząstkowych.	K_W03	4
RRoz_3	Potrafi przeprowadzać podstawowe dowody w zakresie równań różniczkowych, w których stosuje w razie potrzeby narzędzia z innych działów matematyki.	K_U04	3
RRoz_4	Potrafi przygotować prezentacje dotyczące zagadnień z zakresu równań różniczkowych i prezentować je osobom nie będącymi specjalistami w zakresie tych zagadnień.	K_U09	3
RRoz_5	Potrafi określić swoje zainteresowania i je rozwijać; w szczególności jest w stanie nawiązać kontakt ze specjalistami z równań różniczkowych, rozumie ich wykłady przeznaczone dla młodych matematyków.	K_K06	3
RRoz_6	Potrafi posługiwać się językiem angielskim, na poziomie pozwalającym na korzystanie z tekstów obcojęzycznych dotyczących studiowanych zagadnień.	K_U08	4
RRoz_7	Jest gotów do dalszego samokształcenia.	K_K01	4
RRoz_8	Jest gotów do formułowania obiektywnych opinii w zagadnieniach, w których matematyka jest językiem opisu.		

		K_K06	4

9. Methods of conducting classes

Code	Category	Name (description)
a01	Lecture methods / expository methods	Formal lecture/ course-related lecture *a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided*
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*
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*

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
RRoz_fns_1	lecture	15	exam	RRoz_1, RRoz_2, RRoz_3, RRoz_5, RRoz_7, RRoz_8	a01
RRoz_fns_2	discussion classes	30	course work	RRoz_1, RRoz_2, RRoz_3, RRoz_4, RRoz_5, RRoz_6, RRoz_7, RRoz_8	b08, 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 *reading the literature indicated in the syllabus; reviewing, organizing, analyzing and selecting source materials to be used in class*	Yes
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*	No

		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.	
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 optimize participation in classes, including those supplementary to the core subjects listed in the pursued study programme*	No
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	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*	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*	No

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		**Education**
Module code		W4-MT-N2-23-Ped
Number of the ECTS credits		2
Language of instruction		Polish
Purpose and description of the content of education		W ramach modułu realizowane są treści z zakresu pedagogiki niezbędne do uzyskania ogólnego przygotowania psychologiczno-pedagogicznego (zgodnie z wytycznymi zawartymi w Rozporządzeniu Ministra Nauki i Szkolnictwa Wyższego z dnia 25 lipca 2019 r.). Treści realizowane w ramach modułu obejmują: podstawy prawne systemu oświaty niezbędne do prawidłowego realizowania prowadzonych działań edukacyjnych; normy, procedury i dobre praktyki stosowane w działalności pedagogicznej (wychowanie przedszkolne, nauczanie w szkołach podstawowych i średnich ogólnokształcących, technikach i szkołach branżowych, szkołach specjalnych i oddziałach specjalnych oraz integracyjnych, w różnego typu ośrodkach wychowawczych oraz kształceniu ustawicznym); projektować i realizować programy wychowawczo-profilaktyczne w zakresie treści i działań wychowawczych i profilaktycznych skierowanych do uczniów, ich rodziców lub opiekunów i nauczycieli; przygotowanie do pracy w zespole, pełnienia w nim różnych ról oraz współpracy z nauczycielami, pedagogami, specjalistami, rodzicami lub opiekunami uczniów i innymi członkami społeczności szkolnej i lokalnej.
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)**
Ped_01		absolwent zna pojęcie ukrytego programu szkoły, alternatywne formy edukacji, zagadnienie prawa wewnątrzszkolnego, podstawę programową w kontekście programu nauczania oraz działania wychowawczo-profilaktyczne, tematykę oceny jakości działalności szkoły lub placówki systemu oświaty; (B.2.W1.)	KN.2023_W04 KN.2023_W09	4 4
Ped_02		absolwent zna tematykę oceny jakości pracy nauczyciela, zasady projektowania ścieżki własnego rozwoju zawodowego, ścieżkę awansu zawodowego nauczyciela, uwarunkowania sukcesu w pracy nauczyciela oraz choroby związane z wykonywaniem zawodu nauczyciela; (B.2.W2.)	KN.2023_W04	4
Ped_03		absolwent zna i rozumie rolę nauczyciela w organizowaniu współpracy z rodziną ucznia oraz szkoły ze środowiskiem pozaszkolnym, instytucjami opiekuńczymi, kulturalnymi, profilaktycznymi, terapeutycznymi i wsparcia; (B.2.W3.)	KN.2023_W03 KN.2023_W06 KN.2023_W08	4 4 4
Ped_04		absolwent zna i rozumie funkcjonowanie klasy szkolnej jako grupy społecznej, procesy społeczne w klasie, rozwiązywanie konfliktów w klasie lub grupie wychowawczej, animowanie życia społeczno-kulturalnego klasy,	KN.2023_W03	4

	wspieranie samorządności i autonomii uczniów, rozwijanie u dzieci, uczniów lub wychowanków kompetencji komunikacyjnych i umiejętności społecznych niezbędnych do nawiązywania poprawnych relacji; (B.2.W4.)	KN.2023_W09 KN.2023_W12	4 4
Ped_05	absolwent zna i rozumie działania związane z doradztwem zawodowym: wspomaganie ucznia w projektowaniu ścieżki edukacyjno-zawodowej, metody i techniki określania potencjału ucznia oraz potrzebę przygotowania uczniów do uczenia się przez całe życie (B.2.W7.)	KN.2023_W08 KN.2023_W09	3 3
Ped_06	absolwent potrafi zdiagnozować potrzeby edukacyjne ucznia i zaprojektować dla niego odpowiednie wsparcie oraz wskazać kierunki rozwoju osobowego i zawodowego; (B.2.U6.	KN.2023_U02 KN.2023_U03 KN.2023_U04 KN.2023_U12 KN.2023_U14	4 4 4 4 4
Ped_07	absolwent potrafi rozpoznawać sytuację zagrożeń i uzależnień uczniów; (B.2.U5.)	KN.2023_U01 KN.2023_U05	3 3
Ped_08	absolwent potrafi nawiązywać współpracę z nauczycielami oraz ze środowiskiem pozaszkolnym; (B.2.U4.)	KN.2023_KS07 KN.2023_U05 KN.2023_U14	3 3 3
Ped_09	absolwent jest gotów do profesjonalnego rozwiązywania konfliktów w klasie szkolnej lub grupie wychowawczej; (B.2.K2.)	KN.2023_KS01 KN.2023_KS03 KN.2023_U01	2 2 2
Ped_10	absolwent jest gotów do samodzielnego pogłębiania wiedzy pedagogicznej; (B.2.K3.)	KN.2023_KS01 KN.2023_KS06 KN.2023_U18	3 3 3
Ped_11	absolwent jest gotów do współpracy z nauczycielami i specjalistami w celu doskonalenia swojego warsztatu pracy (B.2.K4.)	KN.2023_KS05 KN.2023_KS07 KN.2023_U18	2 2 2

9.	Methods of conducting classes	
Code	**Category**	**Name (description)**
a01	Lecture methods / expository methods	Formal lecture/ course-related lecture *a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided*
a03	Lecture methods / expository methods	Description *a description of objects, phenomena, processes or people; it involves specifying the structure and characteristic features of the object, phenomenon, or process being described; it is usually accompanied by a demonstration of the described object or by its models, drawings, tables, charts, etc.; a description may take the form of an explanation, classification, justification or comparison*
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
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*
d03	Programmed learning methods	Working with another teaching tool *e.g. using websites in any way or according to the rules set by the teacher; or making use of other subject-specific tools*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

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**
Ped_fns_1	lecture	15	course work	Ped_01, Ped_02, Ped_03, Ped_04, Ped_05, Ped_06, Ped_07, Ped_08, Ped_09, Ped_10, Ped_11	a01, a03, c07
Ped_fns_2	discussion classes	15	course work	Ped_01, Ped_02, Ped_03, Ped_04, Ped_05, Ped_06, Ped_07, Ped_08, Ped_09, Ped_10, Ped_11	a03, b08, d03, f02

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	No
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
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
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	Yes
c02	Preparation for verification of learning outcomes	Studying the literature used in and the materials produced in class	No

		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	
c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/ examination completion *a set of activities aimed at performing an assigned task, to be executed out of class, as an obligatory phase/element of the verification of the learning outcomes assigned to the course*	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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		**Education Practicium from Mathematics, Tutoring I**
Module code		W4-MT-N2-23-PNMat1
Number of the ECTS credits		4
Language of instruction		Polish
Purpose and description of the content of education		Celem praktyki w szkole jest gromadzenie doświadczeń związanych z pracą dydaktyczno – wychowawczą nauczyciela na III etapie edukacyjnym (szkoła ponadpodstawowa) i konfrontowanie nabytej wiedzy z zakresu matematyki, dydaktyki ogólnej i dydaktyki matematyki z rzeczywistością pedagogiczną w działaniu praktycznym. W trakcie pobytu w szkole student poznaje sposoby funkcjonowania szkoły ponadpodstawowej, jej zadania dydaktyczne, organizację pracy oraz rodzaje związanej z tym dokumentacji. Uczy się również wyciągać wnioski z aktywnej obserwacji pracy dydaktycznej nauczyciela (stosowanych przez niego metod, form pracy, środków dydaktycznych, sposobów oceniania, sposobów zadawania pracy domowej), samodzielnie planować i przeprowadzać lekcje matematyki oraz analizować obserwowane i doświadczane zdarzenia pedagogiczne. Przygotowuje się też do współdziałania z nauczycielami celem poszerzania wiedzy i rozwijania umiejętności wychowawczych.
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)**
PNMat1_01	Student zna i rozumie zadania dydaktyczne realizowane przez szkołę lub placówkę systemu oświaty	KN.2023_U13 KN.2023_W08 KN.2023_W09	3 3 3
PNMat1_02	Student zna i rozumie sposób funkcjonowania oraz organizację pracy dydaktycznej szkoły lub placówki systemu oświaty	KN.2023_U04 KN.2023_U18 KN.2023_W08 KN.2023_W09 KN.2023_W11	3 3 3 3 1
PNMat1_03	Student zna i rozumie rodzaje dokumentacji działalności dydaktycznej prowadzonej w szkole lub placówce systemu oświaty	KN.2023_U02	2

		KN.2023_U13	3
		KN.2023_U17	1
		KN.2023_W08	3
		KN.2023_W09	3
PNMat1_04	Student potrafi wyciągnąć wnioski z obserwacji pracy dydaktycznej nauczyciela, jego interakcji z uczniami oraz sposobu planowania i przeprowadzania zajęć dydaktycznych; aktywnie obserwować stosowane przez nauczyciela metody i formy pracy oraz wykorzystywane pomoce dydaktyczne, a także sposoby oceniania uczniów oraz zadawania i sprawdzania pracy domowej	KN.2023_KS04	1
		KN.2023_KS05	1
		KN.2023_KS06	1
		KN.2023_KS07	1
		KN.2023_U01	3
		KN.2023_U08	3
		KN.2023_U11	3
		KN.2023_W02	3
		KN.2023_W04	3
		KN.2023_W12	3
		KN.2023_W15	3
PNMat1_05	Student potrafi zaplanować i przeprowadzić pod nadzorem opiekuna praktyk zawodowych serię lekcji lub zajęć;	KN.2023_U02	3
		KN.2023_U03	3
		KN.2023_U15	3
		KN.2023_W02	3
		KN.2023_W04	3
		KN.2023_W14	3
PNMat1_06	student potrafi analizować przy pomocy opiekuna praktyk zawodowych sytuacje i zdarzenia pedagogiczne zaobserwowane lub doświadczone w czasie praktyk	KN.2023_U02	3
		KN.2023_U13	3
		KN.2023_W04	3
		KN.2023_W06	3
		KN.2023_W15	3
PNMat1_07	Student jest gotów do skutecznego współdziałania z opiekunem praktyk zawodowych i nauczycielami w celu poszerzania swojej wiedzy dydaktycznej oraz rozwijania umiejętności wychowawczych.	KN.2023_KS01	3
		KN.2023_KS03	3
		KN.2023_KS05	3
		KN.2023_KS07	3
		KN.2023_W01	1

9.	Methods of conducting classes	
Code	**Category**	**Name (description)**
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
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.*
e05	Practical methods	Internship *including professional and individual training; gaining skills and experience in real-life conditions, e.g., in the environment, institution or workplace the student is preparing for by following a specific study programme; training in real working conditions*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

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**
PNMat1_01	workshop	45	course work	PNMat1_01, PNMat1_02, PNMat1_03, PNMat1_04, PNMat1_05, PNMat1_06, PNMat1_07	d02, e05, f02
PNMat1_02	tutoring	1	course work	PNMat1_04, PNMat1_06	b04

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	Yes
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
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
a05	Preparation for classes	Production/preparation of tools, materials or documentation necessary for class participation *developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios,*	Yes

		research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes	

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Education Practicium from Mathematics, Tutoring II
Module code		W4-MT-N2-23-PNMat2
Number of the ECTS credits		4
Language of instruction		Polish
Purpose and description of the content of education		Celem praktyki w szkole jest gromadzenie doświadczeń związanych z pracą dydaktyczno – wychowawczą nauczyciela na III etapie edukacyjnym (szkoła ponadpodstawowa) i konfrontowanie nabytej wiedzy z zakresu matematyki, dydaktyki ogólnej i dydaktyki matematyki z rzeczywistością pedagogiczną w działaniu praktycznym. W trakcie pobytu w szkole student poznaje sposoby funkcjonowania szkoły ponadpodstawowej, jej zadania dydaktyczne, organizację pracy oraz rodzaje związanej z tym dokumentacji. Uczy się również wyciągać wnioski z aktywnej obserwacji pracy dydaktycznej nauczyciela (stosowanych przez niego metod, form pracy, środków dydaktycznych, sposobów oceniania, sposobów zadawania pracy domowej), samodzielnie planować i przeprowadzać lekcje matematyki oraz analizować obserwowane i doświadczane zdarzenia pedagogiczne. Przygotowuje się też do współdziałania z nauczycielami celem poszerzania wiedzy i rozwijania umiejętności wychowawczych.
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)**
PNMat2_01	Student zna i rozumie zadania dydaktyczne realizowane przez szkołę lub placówkę systemu oświaty	KN.2023_U13 KN.2023_W08 KN.2023_W09	3 3 3
PNMat2_02	Student zna i rozumie sposób funkcjonowania oraz organizację pracy dydaktycznej szkoły lub placówki systemu oświaty	KN.2023_U04 KN.2023_U18 KN.2023_W08 KN.2023_W09 KN.2023_W11	3 3 3 3 1
PNMat2_03	Student zna i rozumie rodzaje dokumentacji działalności dydaktycznej prowadzonej w szkole lub placówce systemu oświaty	KN.2023_U13	3

		KN.2023_W08	3
		KN.2023_W09	3
		KN.2023_W11	4
		KN.2023_W14	2
PNMat2_04	Student potrafi wyciągnąć wnioski z obserwacji pracy dydaktycznej nauczyciela, jego interakcji z uczniami oraz sposobu planowania i przeprowadzania zajęć dydaktycznych; aktywnie obserwować stosowane przez nauczyciela metody i formy pracy oraz wykorzystywane pomoce dydaktyczne, a także sposoby oceniania uczniów oraz zadawania i sprawdzania pracy domowej	KN.2023_KS04	1
		KN.2023_KS05	1
		KN.2023_KS06	1
		KN.2023_KS07	1
		KN.2023_U01	3
		KN.2023_U08	3
		KN.2023_U11	2
		KN.2023_W02	3
		KN.2023_W04	3
		KN.2023_W12	3
		KN.2023_W15	3
PNMat2_05	Student potrafi zaplanować i przeprowadzić pod nadzorem opiekuna praktyk zawodowych serię lekcji lub zajęć	KN.2023_U02	3
		KN.2023_U03	3
		KN.2023_U15	3
		KN.2023_W02	3
		KN.2023_W04	3
		KN.2023_W14	3
PNMat2_06	student potrafi analizować przy pomocy opiekuna praktyk zawodowych sytuacje i zdarzenia pedagogiczne zaobserwowane lub doświadczone w czasie praktyk	KN.2023_U02	3
		KN.2023_U13	3
		KN.2023_W04	3
		KN.2023_W06	3
PNMat2_07	Student jest gotów do skutecznego współdziałania z opiekunem praktyk zawodowych i nauczycielami w celu poszerzania swojej wiedzy dydaktycznej oraz rozwijania umiejętności wychowawczych.	KN.2023_KS01	3
		KN.2023_KS03	3
		KN.2023_KS05	3
		KN.2023_KS07	3
		KN.2023_W01	1

9.	Methods of conducting classes		
Code	**Category**	**Name (description)**	
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
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.*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

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**
PNMat2_01	workshop	45	course work	PNMat2_01, PNMat2_02, PNMat2_03, PNMat2_04, PNMat2_05, PNMat2_06, PNMat2_07	d02, f02
PNMat2_02	tutoring	1	course work	PNMat2_04, PNMat2_06	b04

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	Yes
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
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
a05	Preparation for classes	Production/preparation of tools, materials or documentation necessary for class participation *developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes*	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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Elements of Cryptography
Module code		W4-MT-N2-23-WKry
Number of the ECTS credits		3
Language of instruction		Polish
Purpose and description of the content of education		1.Wstęp do kryptografii. Podstawowe pojęcia kryptografii i kryptoanalizy. Różnica między kodowaniem i szyfrowaniem. 2.Podstawy teoretyczne kryptografii, teoria informacji, teoria złożoności obliczeniowej, teoria liczb. 3.Algorytmy klasyczne.
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)**
WKry_1	Znajomość podstawowych grup systemów kryptograficznych		K_W04	5
			K_W05	2
WKry_2	Umiejętność szyfrowania i deszyfrowania w określonym systemie kryptograficznym		K_K02	1
			K_W04	1
WKry_3	Stosowanie podstawowych zasad zabezpieczenia danych		K_W04	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*
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*
b09	Problem-solving methods	Activating method – flipped classroom

			anticipatory learning; work in class is based on previously studied material indicated by the person teaching the course; preparation outside the classroom serves the purpose of getting familiar with the issues whose knowledge is necessary for participating in the in-class discussion and the training in the related practical skills; the activity is based on the work of students under the guidance of the person teaching the course
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*
d03		Programmed learning methods	Working with another teaching tool *e.g. using websites in any way or according to the rules set by the teacher; or making use of other subject-specific tools*

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**
WKry_fn_1	lecture	15	course work	WKry_1, WKry_2	b02, c07
WKry_fn_2	discussion classes	15	course work	WKry_1, WKry_2, WKry_3	b08, b09, d03

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
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	Yes
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

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name	**Entrepreneurship, Intellectual Property Protection**	
Module code	W4-MT-N2-23-POWI	
Number of the ECTS credits	1	
Language of instruction	Polish	
Purpose and description of the content of education	Moduł Przedsiębiorczość i ochrona własności intelektualnej, BHP ma na celu zapoznanie studentów z podstawowymi pojęciami przedsiębiorczości i możliwościami realizacji własnej inicjatywy gospodarczej. Przewiduje się realizację następujących treści programowych: 1. Podstawowe pojęcia przedsiębiorczości 1.1.. Pojęcie, typy i znaczenie przedsiębiorczości. 1.2. Typy przedsiębiorstw firm. 2. Charakterystyka przedsiębiorcy 2.1. Pojęcie przedsiębiorcy w literaturze. 2.2. Charakterystyka przedsiębiorcy. 2.3. Etyczne postępowanie przedsiębiorcy. 3. Organizowanie przedsięwzięć 3.1. Planowanie przedsięwzięć, przygotowanie biznesplanów. 3.2. Pozyskiwanie funduszy na działalność przedsiębiorstwa. 3.3. Analiza przypadków (case study), przykłady biznesplanów. 4. Ochrona własności przemysłowej i prawa autorskiego 5. Podstawy bezpieczeństwa i higieny pracy	
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)**
POWI_1	Rozumie znaczenie przedsiębiorczości w gospodarce rynkowej		K_K07	2
POWI_2	Potrafi określić cechy dobrego przedsiębiorcy		K_K03	2
POWI_3	Posiada wiedzę o podstawowych aspektach prawnych i etycznych przedsiębiorcy		K_K03	2
POWI_4	Wie jak zacząć i podjąć samodzielne i grupowe działania przedsiębiorcze		K_U10	5

POWI_5	Zna sposoby przygotowywania planu działań przedsiębiorczych i metody ich realizacji	K_U10	4
POWI_6	Zna podstawowe pojęcia z zakresu ochrony własności przemysłowej i prawa autorskiego	K_W06	4

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*

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**
POWI_fns_1	lecture	15	course work	POWI_1, POWI_2, POWI_3, POWI_4, POWI_5, POWI_6	b02

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*	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
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name	**First Aid**	
Module code	W4-MT-N2-23-PPom	
Number of the ECTS credits	1	
Language of instruction	Polish	
Purpose and description of the content of education	Celem modułu jest omówienie zagadnień związanych z bezpieczeństwem uczniów w szkole (placówce oświatowej) i poza nią a także udzielanie pomocy przedmedycznej.	
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)
PPom_1	student zna zasady zapewniania bezpieczeństwa uczniom w szkole i poza nią	KN.2023_U17	3
		KN.2023_W11	3

9.	Methods of conducting classes	

Code	Category	Name (description)
b06	Problem-solving methods	**Activating method – staged drama/drama** *experiential learning; solving a problem by acting out a role; a.k.a. a role-playing method; role-players interpret their roles in an individual way; the identification with the role is achieved through the activation of the senses, imagination and speech, the stimulation of gesture and movement, etc.; the aim of drama is to experience situations, problems and events mediated by the role; staged drama is a role-playing method enriched with props and stage scenery illustrating a theme*
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*

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**
PPom_ns_1	workshop		5	course work	PPom_1	b06, c06

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*	Yes
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
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Functional Analysis
Module code		W4-MT-N2-23-AFun
Number of the ECTS credits		6
Language of instruction		Polish
Purpose and description of the content of education		Moduł Analiza funkcjonalna ma na celu wykształcenie umiejętności posługiwania się podstawowymi metodami analizy funkcjonalnej, doboru stosownych przestrzeni i wykorzystania odpowiednich operatorów w szeroko rozumianej analizie. Przewiduje się realizację następujących treści programowych: 1. Przestrzenie unormowane i przestrzenie Banacha. 2. Przestrzenie unitarne i przestrzenie Hilberta. 3. Prostopadłość i rzutowanie prostopadłe. Twierdzenia o zbiorze wypukłym i rzucie prostopadłym. 4. Układy ortonormalne i szeregi Fouriera w przestrzeni Hilberta. 5. Przekształcenia liniowe przestrzeni unormowanych. 6. Przestrzeń sprzężona. Twierdzenie Riesza. 7. Twierdzenia Hahna-Banacha, o odwzorowaniu otwartym, o domkniętym wykresie, Banacha-Steinhausa. 8. Układ trygonometryczny i jego zupełność.
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)
AFun_1	zna i rozumie klasyczną wiedzę z zakresu analizy funkcjonalnej	K_W01	5
AFun_2	zna i rozumie rolę i znaczenie konstrukcji rozumowań matematycznych z zakresu analizy funkcjonalnej	K_W02	3
AFun_3	zna i rozumie najważniejsze twierdzenia analizy funkcjonalnej	K_W03	5
AFun_4	potrafi konstruować rozumowania matematyczne z zakresu analizy funkcjonalnej i sprawdzać ich poprawność	K_U01 K_U03	3 3
AFun_5	potrafi wyrażać treści matematyczne z zakresu analizy funkcjonalnej w mowie i na piśmie	K_U02	3

9. Methods of conducting classes

Code	Category	Name (description)
a01	Lecture methods / expository methods	**Formal lecture/ course-related lecture** *a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided*
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*
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.*
d04	Programmed learning methods	**Reconstruction / reproduction** *proceeding according to the indicated/displayed pattern/model; e.g., the reconstruction of a structure, model, image, 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*

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
AFun_fns_1	lecture	15	exam	AFun_1, AFun_2, AFun_3, AFun_4, AFun_5	a01
AFun_fns_2	discussion classes	30	course work	AFun_1, AFun_2, AFun_3, AFun_4, AFun_5	b08, d02, d04, e01

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)*	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*	Yes

		of the task aimed at checking the level of the achieved learning outcomes	
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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Fundamentals of Didactics II
Module code		W4-MT-N2-23-PDyd2
Number of the ECTS credits		2
Language of instruction		Polish
Purpose and description of the content of education		W ramach modułu student zdobędzie umiejętności w zakresie 1) identyfikowania potrzeby dostosowania metod pracy do klasy zróżnicowanej pod względem poznawczym, kulturowym, statusu społecznego lub materialnego; 2) projektowania działań służących integracji klasy szkolnej; 3) dobierania metod nauczania do nauczanych treści i zorganizować pracę uczniów; 4) wybierania modelu lekcji i zaprojektowania jej struktury; 5) zaplanowania pracy z uczniem zdolnym, przygotowującej go do udziału w konkursie przedmiotowym lub współzawodnictwie sportowym; 6) dokonania oceny pracy ucznia i zaprezentowania jej w formie oceny kształtującej
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)
PDyd2_01	Student zna usytuowanie dydaktyki w zakresie pedagogiki, a także przedmiot i zadania współczesnej dydaktyki oraz relację dydaktyki ogólnej do dydaktyk szczegółowych.	KN.2023_W01 KN.2023_W08	4 4
PDyd2_02	Student rozumie zagadnienie klasy szkolnej jako środowiska edukacyjnego: style kierowania klasą, problem ładu i dyscypliny, procesy społeczne w klasie, integrację klasy szkolnej, tworzenie środowiska sprzyjającego postępom w nauce oraz sposób nauczania w klasie zróżnicowanej pod względem poznawczym, kulturowym, statusu społecznego lub materialnego.	KN.2023_U01 KN.2023_U12 KN.2023_W10 KN.2023_W11	3 3 3 3
PDyd2_03	Student zna współczesne koncepcje nauczania i cele kształcenia – źródła, sposoby ich formułowania oraz ich rodzaje; zasady dydaktyki, metody nauczania, treści nauczania i organizację procesu kształcenia oraz pracy uczniów.	KN.2023_U04 KN.2023_U06 KN.2023_W15	3 3 3
PDyd2_04	Student zna zagadnienie lekcji jako jednostki dydaktycznej oraz jej budowę, modele lekcji i sztukę prowadzenia lekcji, a także style i techniki pracy z uczniami; interakcje w klasie; środki dydaktyczne.	KN.2023_U13	2
PDyd2_05	Student rozumie konieczność projektowania działań edukacyjnych dostosowanych do zróżnicowanych potrzeb i możliwości uczniów, w szczególności możliwości psychofizycznych oraz tempa uczenia się, a także potrzebę i sposoby	KN.2023_U03 KN.2023_U04	1 1

	wyrównywania szans edukacyjnych, znaczenie odkrywania oraz rozwijania predyspozycji i uzdolnień oraz zagadnienia związane z przygotowaniem uczniów do udziału w konkursach i olimpiadach przedmiotowych; autonomię dydaktyczną nauczyciela.	KN.2023_U06 KN.2023_U07	1 1
PDyd2_06	Student zna sposoby i znaczenie oceniania osiągnięć szkolnych uczniów: ocenianie kształtujące w kontekście efektywności nauczania, wewnątrzszkolny system oceniania, rodzaje i sposoby przeprowadzania sprawdzianów i egzaminów zewnętrznych; tematykę oceny efektywności dydaktycznej nauczyciela i jakości działalności szkoły oraz edukacyjną wartość dodaną.	KN.2023_KS03 KN.2023_U08 KN.2023_U10	1 1 1
PDyd2_07	Student potrafi zidentyfikować potrzeby dostosowania metod pracy do klasy zróżnicowanej pod względem poznawczym, kulturowym, statusu społecznego lub materialnego.	KN.2023_KS02 KN.2023_U03 KN.2023_U12 KN.2023_U13	2 2 2 2
PDyd2_08	Student potrafi zaprojektować działania służące integracji klasy szkolnej.	KN.2023_U02 KN.2023_U05 KN.2023_U09	2 2 2
PDyd2_09	Student potrafi wybrać model lekcji i zaprojektować jej strukturę.	KN.2023_W15	2
PDyd2_10	Student potrafi zaplanować pracę z uczniem zdolnym, przygotowującą go do udziału w konkursie przedmiotowym lub współzawodnictwie sportowym	KN.2023_U02 KN.2023_U03 KN.2023_U07	2 2 2
PDyd2_11	Student potrafi dokonać oceny pracy ucznia i zaprezentować ją w formie oceny kształtującej.	KN.2023_U10	1
PDyd2_12	Student potrafi twórczego poszukiwania najlepszych rozwiązań dydaktycznych sprzyjających postępom uczniów.	KN.2023_U08 KN.2023_U14	3 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*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

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**	
PDyd2_01	lecture	30	course work	PDyd2_01, PDyd2_02, PDyd2_03, PDyd2_04, PDyd2_05, PDyd2_06, PDyd2_07, PDyd2_08,	b02, f02	

				PDyd2_09, PDyd2_10, PDyd2_11, PDyd2_12	

11.	The student's work, apart from participation in classes, includes in particular:			
Code	**Category**	**Name (description)**		**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*		Yes
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
a05	Preparation for classes	Production/preparation of tools, materials or documentation necessary for class participation *developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes*		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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		General academic module (Humanities)
Module code		OOD_2024_NS_MOH
Number of the ECTS credits		3
Language of instruction		
Purpose and description of the content of education		The humanistic general academic module allows the student to get acquainted with selected areas of the subject-related specificity of humanities. The student has a chance to compare different methodological and interpretative approaches, and gains knowledge about the benefits of adopting a humanistic perspective of the view of reality. The student learns to implement recognized paradigms of humanistic thinking into their scientific activity, creatively solving the problems posed during the classes. Based on specific cases, the student trains the ability to integrate views appropriate for humanities with the points of view that belong to the fields of science and scientific disciplines appropriate for the studied programme. During the meetings, the student identifies manners of participation in present and future cultural formations, recognizing the paths of individual participation in the life of adequate human communities in the presented and experienced activities.
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)**
HMO1_1		The student knows selected issues related to the subject-related specificity of the humanities, understands their nature, place and importance in the system of sciences, as well as their connections with fields of science and scientific disciplines specific to the studied programme, allowing for the integration of perspectives appropriate for different scientific disciplines..	OOD.2024_U01 OOD.2024_W01	3 3
HMO1_2		The student is able to select, interpret and evaluate knowledge from selected disciplines in the field of humanities and integrate and apply it in scientific activity and professional practice in a manner that allows for original and creative solutions to problems that they experience as participants in cultural life.	OOD.2024_U01 OOD.2024_W01	3 3
HMO1_3		The student is able to creatively undertake, analyse and become involved in current sociocultural discourses, using knowledge of the studied problems of contemporary humanities and acquired communication skills as well as subject-related argumentation that considers various scientific approaches and types of scientific reflection.	OOD.2024_U01 OOD.2024_W01	3 3
HMO1_4		The student, who is a participant in cultural life in its various manifestations, shows the need for continuous learning and improvement of those dispositions that allow to appreciate humanistic reflection and integrate it with issues and experiences resulting from choosing one's own path of scientific and professional activities and related to individual	OOD.2024_KS01 OOD.2024_U01 OOD.2024_W01	2 2 2

	cultural activity.		

9.	**Methods of conducting classes**		
Code	**Category**	**Name (description)**	
a03	Lecture methods / expository methods	**Description** *a description of objects, phenomena, processes or people; it involves specifying the structure and characteristic features of the object, phenomenon, or process being described; it is usually accompanied by a demonstration of the described object or by its models, drawings, tables, charts, etc.; a description may take the form of an explanation, classification, justification or comparison*	
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*	
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*	
d03	Programmed learning methods	**Working with another teaching tool** *e.g. using websites in any way or according to the rules set by the teacher; or making use of other subject-specific tools*	
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*	
f02	Methods of self-learning	**Individual work with a text** *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*	

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**
01	depending on the choice	14	course work	HMO1_1, HMO1_2, HMO1_3, HMO1_4	a03, a05, b04, c07, d03, f01, f02

11.	**The student's work, apart from participation in classes, includes in particular:**		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation	No

		reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes	
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
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*	Yes
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	Yes
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
e01	Activities complementary to the classes	Undertaking, on one's own initiative and individually, activities aimed at expanding the scope or depth of the teaching content, also beyond the walls of the University *a set of activities undertaken independently and on the student's own initiative, aimed at expanding the depth and scope of knowledge and skills, their revision and repetition, retention or verification, also activities carried outside the university, e.g., in a culture promoting or educational institution, a laboratory, in the open air, etc.; also self-education*	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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name	**General academic module (Social Sciences)**	
Module code	OOD_2024_NS_MOS	
Number of the ECTS credits	3	
Language of instruction		
Purpose and description of the content of education	The social general academic module allows the student to get acquainted with selected areas of the subject-related specificity of social sciences. The student has a chance to compare different methodological and interpretative approaches, gains knowledge about the benefits of adopting a perspective of reality appropriate for social sciences. Based on specific cases, the student trains the ability to integrate views appropriate for social sciences with points of view that belong to fields of science and scientific disciplines appropriate for the studied programme.	
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)**
SMOSN1_1	The student knows selected issues related to the subject-related specificity of social sciences, understands their nature, place and importance in the system of sciences, as well as their connections with fields of science and scientific disciplines specific to the studied programme, allowing for the integration of perspectives appropriate for different scientific disciplines.	OOD.2024_U01 OOD.2024_W01	3 3
SMOSN1_2	The student is able to select, interpret and evaluate knowledge from selected disciplines in the field of social sciences and integrate and apply it in scientific activity and professional practice in a manner that allows for original and creative solutions to problems that they experience as participants in social life.	OOD.2024_U01 OOD.2024_W01	3 3
SMOSN1_3	The student is able to creatively undertake, analyse and become involved in current sociocultural discourses, using knowledge of the studied content, acquired communication skills and subject-related argumentation taking into account various scientific approaches and types of scientific reflection.	OOD.2024_U01 OOD.2024_W01	3 3
SMOSN1_4	The student, who is a participant in social life in its various manifestations, shows the need for continuous learning and improvement of those dispositions that result from choosing their own path of scientific and professional activities and related to individual social activity.	OOD.2024_KS01 OOD.2024_U01 OOD.2024_W01	2 2 2

9.	Methods of conducting classes		
Code	**Category**		**Name (description)**
a03	Lecture methods / expository methods		Description *a description of objects, phenomena, processes or people; it involves specifying the structure and characteristic features of the object, phenomenon, or process being described; it is usually accompanied by a demonstration of the described object or by its models, drawings, tables, charts, etc.; a description may take the form of an explanation, classification, justification or comparison*
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*
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*
d03	Programmed learning methods		Working with another teaching tool *e.g. using websites in any way or according to the rules set by the teacher; or making use of other subject-specific tools*
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*
f02	Methods of self-learning		Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

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**
01	depending on the choice		14	course work	SMOSN1_1, SMOSN1_2, SMOSN1_3, SMOSN1_4	a03, a05, b04, c07, d03, f01, f02

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	No

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
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*	Yes
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	Yes
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
e01	Activities complementary to the classes	Undertaking, on one's own initiative and individually, activities aimed at expanding the scope or depth of the teaching content, also beyond the walls of the University *a set of activities undertaken independently and on the student's own initiative, aimed at expanding the depth and scope of knowledge and skills, their revision and repetition, retention or verification, also activities carried outside the university, e.g., in a culture promoting or educational institution, a laboratory, in the open air, etc.; also self-education*	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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Geometry in secondary school
Module code		W4-MT-N2-23-GSzkPP
Number of the ECTS credits		2
Language of instruction		Polish
Purpose and description of the content of education		Celem przedmiotu jest zapoznanie studentów z podstawowymi zagadnieniami geometrii klasycznej, w zakresie niezbędnym do nauczania geometrii w szkole i przygotowywania uczniów do startów w konkursach i olimpiadach przedmiotowych w zakresie szkoły ponadpodstawowej.
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)**
GSzkPP_01	student zna podstawowe pojęcia (obiekty, przekształcenia, twierdzenia) geometryczne, potrafi się nimi posługiwać w mowie i piśmie		K_U01 K_W04 K_W05	3 3 3
GSzkPP_02	student zna schematy dowodów kluczowych twierdzeń omówionych na wykładzie		K_W02 K_W04 K_W05	3 3 3
GSzkPP_03	student zna podstawy geometrii euklidesowej, zna własności podstawowych figur i brył geometrycznych		KN.2023_U03 KN.2023_W14	2 4
GSzkPP_04	student potrafi zastosować poznane narzędzia geometryczne w zadaniach i sytuacjach problemowych		KN.2023_U03 KN.2023_W15	2 2

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*

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*
d03	Programmed learning methods	Working with another teaching tool *e.g. using websites in any way or according to the rules set by the teacher; or making use of other subject-specific tools*
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*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

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**
01	discussion classes	15	course work	GSzkPP_01, GSzkPP_02, GSzkPP_03, GSzkPP_04	a05, b08, d03, e01, f02

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	Yes
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
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*	No
a05	Preparation for classes	Production/preparation of tools, materials or documentation necessary for class participation *developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes*	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*	Yes
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*	Yes

		online, etc.	
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
c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/ examination completion *a set of activities aimed at performing an assigned task, to be executed out of class, as an obligatory phase/element of the verification of the learning outcomes assigned to the course*	No

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.

University of Silesia in Katowice

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Graduate Seminar I
Module code		W4-MT-N2-23-SMag1
Number of the ECTS credits		2
Language of instruction		Polish
Purpose and description of the content of education		Moduł Seminarium magisterskie I ma na celu wykształcenie umiejętności posługiwania się w mowie zrozumiałym językiem matematycznym oraz precyzyjnego formułowania i uzasadniania wypowiadanych treści matematycznych, a także uświadomienie potrzeby dokształcania się. Ze względu na charakter modułu przewiduje się, że treści programowe będą dobierane indywidualnie w zależności od tematyki prac magisterskich.
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)
SMag1_1	dobrze rozumie role i znaczenie rozumowań matematycznych związanych z tematyką pracy magisterskiej		K_W02	3
SMag1_2	potrafi posługiwać się literaturą, także obcojęzyczną, w celu przygotowania opracowanie dotyczącego tematyki pracy magisterskiej		K_U08	3
SMag1_3	zna ograniczenie własnej wiedzy i rozumie potrzebę zgłębienia wiedzy związanej z tematyką pracy magisterskiej		K_K01 K_K02	3 5
SMag1_4	potrafi formułować pytania służące pogłębianiu własnej wiedzy związanej z tematyką pracy magisterskiej		K_K02	5
SMag1_5	umie przedstawić ustnie, na forum grupy, przygotowane opracowanie związane z tematyką pracy magisterskiej		K_K04 K_U02 K_U09	4 3 4
SMag1_6	potrafi przedstawić pisemne opracowanie wybranego materiału związanego z tematyką pracy magisterskiej		K_U02	3

9.	Methods of conducting classes		
Code	Category		Name (description)
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
b05	Problem-solving methods	Activating method – seminar / proseminar *a seminar method; usually an oral presentation of a previously studied/diagnosed problem delivered on a forum; it aims at provoking a discussion concerning the results of research work; a type of conference, course or training session modelled on seminar classes*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*
f03	Methods of self-learning	Conceptual work *a (mainly intellectual) activity carried out independently (or in a selected group) resulting in the creation of a concept, idea or project; creating a plan based on a vision; developing a general outline of a project; producing a simplified sketch of the variant versions of a procedure/product/work*

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**
SMag1_fns_1	seminar	30	course work	SMag1_1, SMag1_2, SMag1_3, SMag1_4, SMag1_5, SMag1_6	b04, b05, f02, f03

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*	Yes
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
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
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 optimize participation in classes, including those supplementary to the core subjects listed in the pursued study programme*	Yes
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *devising a task implementation strategy embracing the division of content, the range of activities,*	Yes

		implementation time and/or the method(s) of obtaining the necessary materials and tools, etc.	
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

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Graduate Seminar II
Module code		W4-MT-N2-23-SMag2
Number of the ECTS credits		2
Language of instruction		Polish
Purpose and description of the content of education		Moduł Seminarium magisterskie II ma na celu wykształcenie umiejętności posługiwania się, w mowie i w piśmie, precyzyjnym językiem matematycznym z uwzględnieniem zrozumienia roli dowodu w matematyce. Ze względu na charakter modułu przewiduje się, że treści programowe będą ściśle związane z treściami programowymi modułu Seminarium magisterskie I.
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)**
SMag2_1		dobrze rozumie rolę i znaczenie rozumowań matematycznych w przygotowywanej pracy magisterskiej	K_W02	3
SMag2_2		umie przedstawić na forum grupy opracowanie dotyczące przygotowywanej pracy magisterskiej	K_K04	4
			K_U02	4
			K_U09	4
SMag2_3		potrafi posługiwać się literaturą, także obcojęzyczną, w celu przygotowania opracowanie dotyczącego tematyki pracy magisterskiej	K_U08	3
SMag2_4		rozumie potrzebę popularnego przedstawiania osiągnięć matematyki poprzez zredagowanie i upublicznienie pracy magisterskiej	K_K04	5
SMag2_5		rozumie i docenia znaczenie uczciwości intelektualnej w działaniach własnych i innych osób; postępuje etycznie	K_K03	5

9.	Methods of conducting classes	
Code	**Category**	**Name (description)**
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
b05		Problem-solving methods	**Activating method – seminar / proseminar** *a seminar method; usually an oral presentation of a previously studied/diagnosed problem delivered on a forum; it aims at provoking a discussion concerning the results of research work; a type of conference, course or training session modelled on seminar classes*
f02		Methods of self-learning	**Individual work with a text** *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*
f03		Methods of self-learning	**Conceptual work** *a (mainly intellectual) activity carried out independently (or in a selected group) resulting in the creation of a concept, idea or project; creating a plan based on a vision; developing a general outline of a project; producing a simplified sketch of the variant versions of a procedure/product/work*

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**
SMag2_fns_1	seminar		30	course work	SMag2_1, SMag2_2, SMag2_3, SMag2_4, SMag2_5	b04, b05, f02, f03

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*		Yes
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
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
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 optimize participation in classes, including those supplementary to the core subjects listed in the pursued study programme*		Yes
c01	Preparation for verification of learning outcomes	**Determining the stages of task implementation contributing to the verification of learning outcomes** *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.*		Yes
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*		No

		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	

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Graduate Workshop
Module code		W4-MT-N2-23-PMag
Number of the ECTS credits		10
Language of instruction		Polish
Purpose and description of the content of education		Na pracowni magisterskiej student: •Pod kierunkiem promotora zapoznaje się z problemem realizowanym w ramach pracy, metodyką prowadzenia badań, oraz literaturą fachową, •Podejmuje badania pod kątem realizowania tematu pracy dyplomowej, •Opracowuje, interpretuje i dyskutuje uzyskane wyniki.
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)**
PMag_1		dobrze rozumie rolę i znaczenie rozumowań matematycznych w przygotowywanej pracy magisterskiej	K_W02	3
PMag_2		potrafi przedstawić całościowe pisemne opracowanie dotyczące przygotowywanej pracy magisterskiej	K_U02	3
PMag_3		rozumie potrzebę popularnego przedstawiania osiągnięć matematyki poprzez zredagowanie i upublicznienie pracy magisterskiej	K_K04	5
PMag_4		rozumie i docenia znaczenie uczciwości intelektualnej w działaniach własnych i innych osób; postępuje etycznie	K_K03	5

9.	Methods of conducting classes	
Code	**Category**	**Name (description)**
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*
b05	Problem-solving methods	Activating method – seminar / proseminar

		a seminar method; usually an oral presentation of a previously studied/diagnosed problem delivered on a forum; it aims at provoking a discussion concerning the results of research work; a type of conference, course or training session modelled on seminar classes

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**
PMag_fns_1	seminar	45	course work	PMag_1, PMag_2, PMag_3, PMag_4	b04, b05

11.	**The student's work, apart from participation in classes, includes in particular:**		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	No
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
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
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	Yes
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

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name	**Mathematical Competition Tasks**	
Module code	W4-MT-N2-23-MZKon	
Number of the ECTS credits	6	
Language of instruction	Polish	
Purpose and description of the content of education	Celem modułu jest zapoznanie studentów z różnymi technikami pracy podczas rozwiązywania zadań sprawiających uczniowi trudności - m.in. zadań konkursowych, zadań „na dowodzenie" oraz zadań tekstowych. Przyczyna uczniowskiego strachu przed podjęciem próby rozwiązania tego typu zadania bardzo często tkwi nie w samym uczniu, a niestety w nauczycielu. Rozwiązywanie tych zadań z uczniami powinno odbywać się bowiem według określonych reguł, których ściśle powinien trzymać się nauczyciel. Dokładna analiza zadania, wykonanie planu rozwiązania (przed jego realizacją) i zrozumienie tych dwóch ważnych kroków powinno stanowić kluczową umiejętność nauczyciela w pracy z uczniami. Studenci, którzy opanują techniki pracy podczas rozwiązywania zadań sprawiających uczniowi trudności będą potrafili w sposób poprawny sterować aktywnością uczniów w procesie nauczania - uczenia się oraz rozwijać indywidualne zdolności swoich wychowanków w przygotowaniu ich do konkursów przedmiotowych.	
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)**
MZKon_01	Student ma pogłębioną i rozszerzoną wiedzę w zakresie nauczanego przedmiotu i umiejętność jej popularyzacji, a także elementaryzacji.	KN.2023_KS07 KN.2023_U08 KN.2023_U09 KN.2023_U11	4 4 4 4
MZKon_02	Student ma umiejętności personalizowania procesu nauczania i wychowania w zależności od zdiagnozowanych zróżnicowanych potrzeb i możliwości uczniów.	KN.2023_U02 KN.2023_U03 KN.2023_W04 KN.2023_W05 KN.2023_W06	4 4 4 4 4
MZKon_03	Student ma kompetencje niezbędne do ciągłego doskonalenia jakości swojej pracy, skutecznie korzystając z technologii informacyjno-komunikacyjnych.	KN.2023_U12	4

		KN.2023_W03	4
MZKon_04	Student ma kompetencje komunikacyjne, umożliwiające skuteczne współdziałanie z wszystkimi osobami zaangażowanymi w prowadzoną przez nauczyciela działalność edukacyjną .	KN.2023_KS02	4
		KN.2023_KS03	4
		KN.2023_U04	4
		KN.2023_U05	4
		KN.2023_W02	4
		KN.2023_W07	4

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*
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*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

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**
MZKon_01	lecture	15	course work	MZKon_01, MZKon_03	b02, f02
MZKon_02	practical classes	15	course work	MZKon_01, MZKon_02, MZKon_03, MZKon_04	b02, e01, f02

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	Yes
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*	No

		elements of the curriculum (as preparation for class participation)	
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

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.

1.	Field of study	**Mathematics**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	**General information about the module**

Module name	**Mathematical Foundations of Computer Science**
Module code	W4-MT-N2-23-MPInf
Number of the ECTS credits	2
Language of instruction	Polish
Purpose and description of the content of education	Celem modułu Matematyczne podstawy informatyki jest wykształcenie umiejętności swobodnego posługiwania się podstawowymi pojęciami informatycznymi w działalności matematycznej. W ramach zajęć przewiduje się realizację następujących treści programowych: 1. Podstawy teorii informacji; pojęcie entropii, kodowanie Huffmana oraz kodowanie Shannona-Fano. 2. Elementy analizy algorytmów. Rozmiar danych, złożoność obliczeniowa. Typy złożoności: pesymistyczna, optymistyczna, średnia. Notacja asymptotyczna, rzędy wielkości funkcji. Algorytmy rekurencyjne. 3. Wybrane metody numeryczne. 4. Matematyczne podstawy kryptografii i jej zastosowania.
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)
MPIn_1	zna pojęcie entropii oraz kodowania optymalnego; zna kodowanie Huffmana oraz kodowanie Shannona-Fano	K_W04	3
MPIn_2	zna i rozumie pojęcie złożoności obliczeniowej (czasowej i pamięciowej) oraz notacji asymptotycznej	K_W04	3
MPIn_3	potrafi wyznaczać złożoność obliczeniową prostych algorytmów, w tym algorytmów rekurencyjnych	K_U05	3
MPIn_4	zna podstawowe algorytmy numeryczne	K_W05	3
MPIn_5	zna matematyczne podstawy kryptografii i jej wybrane zastosowania	K_W05	4

9.	**Methods of conducting classes**	

Code	Category	Name (description)
a01	Lecture methods / expository methods	Formal lecture/ course-related lecture *a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided*

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*
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*

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
MPIn_fns_1	lecture	15	course work	MPIn_1, MPIn_2, MPIn_4, MPIn_5	a01, c07
MPIn_fns_2	laboratory classes	15	course work	MPIn_1, MPIn_2, MPIn_3, MPIn_4, MPIn_5	b08, d01

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
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
c01	Preparation for verification of learning outcomes	**Determining the stages of task implementation contributing to the verification of learning outcomes** *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.*	Yes
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	Analysis of the corrective feedback provided by the academic teacher on the results of the	Yes

	learning outcomes	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*	

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.

University of Silesia in Katowice

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module
Module name	**Mathematical modelling and computer simulation**
Module code	W4-MT-N2-23-MSKom
Number of the ECTS credits	6
Language of instruction	Polish
Purpose and description of the content of education	1. Zapoznanie studenta z rolą i miejscem problematyki modelowania matematycznego w historycznym rozwoju matematyki i nauk pokrewnych. 2. Wprowadzenie potrzebnej wiedzy teoretycznej i pokazanie możliwości stosowania jej do rozwiązywania problemów wywodzących się z zastosowań. 3. Wskazanie powiązań omawianych zagadnień z pokrewnymi dziedzinami nauk. 4. Omówienie metod numerycznych stosowanych do rozwiązywania wybranych zagadnień matematycznych w naukach przyrodniczych. 5. Omówienie możliwych kierunków rozwoju problematyki wykładu i ich znaczenia dla nauki i postępu cywilizacyjnego.
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	zna i rozumie najnowsze odkrycia i kierunki rozwoju wybranych teorii matematycznych	K_W05	2
MSKom_2	potrafi konstruować modele matematyczne, wykorzystywane w konkretnych zastosowaniach matematyki	K_U07	5
MSKom_3	jest gotów do formułowania obiektywnych opinii w zagadnieniach, w których matematyka jest językiem opisu	K_K06	4
MSKom_4	jest gotów do precyzyjnego formułowania pytań służących pogłębieniu własnego zrozumienia danego tematu lub odnalezieniu brakujących elementów rozumowania	K_K02	4
MSKom_5	potrafi w wybranej dziedzinie przeprowadzać dowody, w których stosuje w razie potrzeby również narzędzia z innych działów matematyki	K_U04	3
MSKom_6	zna i rozumie specjalistyczne zagadnienia z wybranej dziedziny matematyki	K_W04	2

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
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_fns_1	lecture	15	exam	MSKom_1, MSKom_2, MSKom_3, MSKom_4, MSKom_5, MSKom_6	b02
MSKom_fns_2	laboratory classes	15	course work	MSKom_1, MSKom_2, MSKom_3, MSKom_4, MSKom_5, MSKom_6	d01

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*	Yes
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
a05	Preparation for classes	Production/preparation of tools, materials or documentation necessary for class participation *developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes*	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 optimize participation in classes, including those supplementary to the core subjects listed in the*	No

		pursued study programme	
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	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*	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*	No
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*	No

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		**Monograph Course**
Module code		W4-MT-N2-23-WMon
Number of the ECTS credits		6
Language of instruction		Polish
Purpose and description of the content of education		Opis zawartości modułu „Wykład monograficzny": 1. Rola i miejsce wykładanego działu matematyki oraz zarys jego rozwoju na tle historycznym. 2. Podstawowe pojęcia i definicje oraz najważniejsze związki między nimi. 3. Główne twierdzenia omawianej teorii matematycznej i przykłady ich zastosowań oraz związków między nimi. 4. Wskazanie związków wykładanej teorii z innymi działami matematyki. 5. Wskazanie nierozwiązanych problemów i perspektyw dalszego rozwoju teorii.
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)
WMon_1	Posiada pogłębioną wiedzę na temat metod i technik omawianych na danym wykładzie monograficznym	K_W03	5
WMon_2	Zna w ramach przedstawianych na wykładzie treści większość definicji i twierdzeń	K_W03	5
WMon_3	Potrafi w ramach wykładanej dziedziny wskazać związki z innymi dziedzinami, a także rozumie zagadnienia znajdujące się na etapie badań	K_U04	5
WMon_4	Potrafi zastosować zdobytą wiedzę w innych działach matematyki czystej i stosowanej	K_U04 K_U05	5 5
WMon_5	Potrafi stawiać i analizować problemy matematyczne w oparciu o wyłożoną teorię oraz jest w stanie nawiązać kontakt ze specjalistami z innych dziedzin matematyki	K_U04 K_U06	4 5
WMon_6	Potrafi w przedstawionej w ramach wykładu wiedzy precyzyjnie formułować pytania dla pogłębienia własnej wiedzy, a także analogie z twierdzeniami i pojęciami wyłożonymi w ramach innych wykładów	K_K02 K_K05	4 4
WMon_7	Potrafi samodzielnie studiować literaturę naukową w ramach wyłożonego przedmiotu	K_K01	4

9.	Methods of conducting classes	
Code	**Category**	**Name (description)**
a02	Lecture methods / expository methods	Monographic lecture *an exhaustive discussion of one issue, usually related to the research interests of the person teaching the course or a thorough presentation of one selected issue*
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*

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**
WMon_fns_1	lecture	15	exam	WMon_1, WMon_2, WMon_3, WMon_4, WMon_5, WMon_6, WMon_7	a02
WMon_fns_2	discussion classes	15	course work	WMon_1, WMon_2, WMon_3, WMon_4, WMon_5, WMon_6, WMon_7	b08

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*	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 optimize participation in classes, including those supplementary to the core subjects listed in the pursued study programme*	No
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *devising a task implementation strategy embracing the division of content, the range of activities,*	Yes

		implementation time and/or the method(s) of obtaining the necessary materials and tools, etc.	
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
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*	No

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Monograph Course in English
Module code		W4-MT-N2-23-WMonE
Number of the ECTS credits		6
Language of instruction		English
Purpose and description of the content of education		Opis zawartości modułu „Wykład monograficzny w języku angielskim": 1. Rola i miejsce wykładanego działu matematyki oraz zarys jego rozwoju na tle historycznym. 2. Podstawowe pojęcia i definicje oraz najważniejsze związki między nimi. 3. Główne twierdzenia omawianej teorii matematycznej i przykłady ich zastosowań oraz związków między nimi. 4. Wskazanie związków wykładanej teorii z innymi działami matematyki. 5. Wskazanie nierozwiązanych problemów i perspektyw dalszego rozwoju teorii.
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)
WMonE_1	Posiada pogłębioną wiedzę na temat metod i technik omawianych na danym wykładzie monograficznym	K_W03	5
WMonE_2	Zna w ramach przedstawianych na wykładzie treści większość definicji i twierdzeń	K_W03	5
WMonE_3	Potrafi w ramach wykładanej dziedziny wskazać związki z innymi dziedzinami, a także rozumie zagadnienia znajdujące się na etapie badań	K_U04	5
WMonE_4	Potrafi zastosować zdobytą wiedzę w innych działach matematyki czystej i stosowanej	K_U04 K_U05	5 5
WMonE_5	Potrafi stawiać i analizować problemy matematyczne w oparciu o wyłożoną teorię oraz jest w stanie nawiązać kontakt ze specjalistami z innych dziedzin matematyki	K_U04 K_U06	4 5
WMonE_6	Potrafi w przedstawionej w ramach wykładu wiedzy precyzyjnie formułować pytania dla pogłębienia własnej wiedzy, a także analogie z twierdzeniami i pojęciami wyłożonymi w ramach innych wykładów	K_K02 K_K05	4 4
WMonE_7	Potrafi samodzielnie studiować literaturę naukową w ramach wyłożonego przedmiotu	K_K01	4

| WMonE_8 | Potrafi na poziomie średniozaawansowanym posługiwać się literaturą w języku angielskim oraz napisać krótkie opracowanie w tym języku na temat omawiany na wykładzie | K_U08 | 4 |
| WMonE_9 | Porozumiewa się w języku obcym posługując się komunikacyjnymi kompetencjami językowymi w stopniu zaawansowanym oraz pogłębioną umiejętność przygotowania różnych prac pisemnych (w tym badawczych) oraz wystąpień ustnych dotyczących zagadnień danego wykładu | K_U08
K_U09 | 4
3 |

9.	Methods of conducting classes	
Code	**Category**	**Name (description)**
a02	Lecture methods / expository methods	Monographic lecture *an exhaustive discussion of one issue, usually related to the research interests of the person teaching the course or a thorough presentation of one selected issue*
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*

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**
WMonE_fns_1	lecture	15	exam	WMonE_1, WMonE_2, WMonE_3, WMonE_4, WMonE_5, WMonE_6, WMonE_7, WMonE_8, WMonE_9	a02
WMonE_fns_2	discussion classes	15	course work	WMonE_1, WMonE_2, WMonE_3, WMonE_4, WMonE_5, WMonE_6, WMonE_7, WMonE_8, WMonE_9	b08

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*	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*	No

		online, etc.	
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 optimize participation in classes, including those supplementary to the core subjects listed in the pursued study programme*	No
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	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*	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
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*	No

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Operating systems with elements of computer architecture
Module code		W4-MT-N2-23-SOAKom
Number of the ECTS credits		3
Language of instruction		Polish
Purpose and description of the content of education		1. Schemat blokowy typowego mikrokomputera 2. Charakterystyka podstawowych bloków funkcjonalnych mikrokomputera. 3. Schemat działania komputera. 4. Klasyfikacja oprogramowania. 5. Oprogramowanie podstawowe – funkcje i podstawowe składniki tego oprogramowania.
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)
SOAKom_1	Zna schemat blokowy i podstawowe bloki funkcjonalne typowego komputera.		K_K01 K_U06	2 1
SOAKom_2	Umie dobierać i konfigurować podstawowe karty rozszerzeń, testować wydajność komputera		K_K01 K_U06	2 1
SOAKom_3	Umie przygotowywać dysk twardy do instalacji systemu operacyjnego oraz zainstalować system operacyjny		K_K01 K_U06	2 1
SOAKom_4	Potrafi skonfigurować wszystkie najważniejsze usługi systemów operacyjnych rodziny Windows i rodziny Linux		K_K01 K_U06	2 1
SOAKom_5	Zna najważniejsze zadania systemu operacyjnego		K_K01 K_U06	2 1

9.	Methods of conducting classes		
Code	**Category**	**Name (description)**	
a03	Lecture methods / expository methods	**Description** *a description of objects, phenomena, processes or people; it involves specifying the structure and characteristic features of the object, phenomenon, or process being described; it is usually accompanied by a demonstration of the described object or by its models, drawings, tables, charts, etc.; a description may take the form of an explanation, classification, justification or comparison*	
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*	
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*	
d03	Programmed learning methods	**Working with another teaching tool** *e.g. using websites in any way or according to the rules set by the teacher; or making use of other subject-specific tools*	

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**	
SOAKom_fns_1	lecture	15	course work	SOAKom_1, SOAKom_3, SOAKom_4, SOAKom_5	a03	
SOAKom_fns_2	laboratory classes	15	course work	SOAKom_1, SOAKom_2, SOAKom_3, SOAKom_4	b08, c06, d01, d03	

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
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*	Yes

		of tasks resulting from or necessary for class participation	
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	Yes
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

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Problem Workshops
Module code		W4-MT-N2-23-WPro
Number of the ECTS credits		2
Language of instruction		Polish
Purpose and description of the content of education		Celem wiodącym modułu Warsztaty problemowe jest zapoznanie studentów z wybranymi obszarami matematyki, mającymi zastosowania w dziedzinach takich jak: ekonomia, biologia, fizyka, chemia, czy informatyka. Celami pośrednimi są: kształcenie umiejętności analitycznych (np. budowanie modeli matematycznych wybranych problemów z dziedzin stosowanych),kształcenie umiejętności metodycznych (np. wykorzystanie dostępnej technologii w celu przygotowania projektu, bądź analizy), kształcenie umiejętności poznawczych (np. analiza danych/treści źródłowych podanych w formie artykułów i podręczników, także obcojęzycznych) oraz kształcenie umiejętności pracy zespołowej (np. praca w małych grupach w czasie warsztatów i poza nimi).
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)
WPro_1	zna zaawansowane techniki obliczeniowe, wspomagające pracę matematyka i rozumie ich ograniczenia	K_W05	2
WPro_2	zna metody stosowane do przybliżonego rozwiązywania problemów z dziedzin stosowanych	K_W04	2
WPro_3	posiada umiejętności wyrażania treści matematycznych, w mowie i piśmie	K_U02	4
WPro_4	potrafi znajdować niezbędne informacje w literaturze fachowej, bazach danych i innych źródłach	K_U08	1
WPro_5	potrafi konstruować modele matematyczne konkretnych problemów z zastosowań matematyki	K_U07	4
WPro_6	zna ograniczenia własnej wiedzy i rozumie potrzebę dalszego kształcenia	K_K01	5

9.	Methods of conducting classes	

Code	Category	Name (description)
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
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

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
WPro_fns_1	workshop	15	course work	WPro_1, WPro_2, WPro_3, WPro_4, WPro_5, WPro_6	b04, f02

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

Code	Category	Name (description)	Is it part of the BUNA?
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	Yes
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
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*	Yes
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		**Psychological and Pedagogical Practices**
Module code		W4-MT-N2-23-PPsPed
Number of the ECTS credits		1
Language of instruction		Polish
Purpose and description of the content of education		Zamierzone efekty kształcenia planuje się osiągnąć dzięki uczestnictwu studentów (w niewielkich grupach typu laboratoryjnego) wraz ze swoim opiekunem (nauczycielem akademickim) w codziennej działalności placówek edukacyjnych oraz opiekuńczo-wychowawczych i resocjalizacyjnych, które realizują kształcenie na II etapie edukacyjnym (szkoła ponadpodstawowa). A zatem moduł ten obejmuje zapoznanie się ze specyfiką pracy różnych typów szkół (zadania charakterystyczne dla placówki danego typu, statut szkoły, ¬ plan pracy szkoły, ¬ program wychowawczo-profilaktyczny, ¬ bezpieczeństwo uczniów w szkole i poza nią itp.). Zadaniem studentów jest obserwacja pracy wychowawczej nauczycieli, w tym prowadzonych przez nich lekcji wychowawczych.
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)**
PPsPed_01		Absolwent zna organizację, statut i plan pracy szkoły, program wychowawczo-profilaktyczny oraz program realizacji doradztwa zawodowego oraz posiada wiedzę pedagogiczną i psychologiczną , pozwalającą na rozumienie procesów rozwoju, socjalizacji, wychowania i nauczania – uczenia się, przydatną w codziennej pracy nauczycielskiej (, umożliwiającą nauczycielowi skuteczną pracę wspierającą integralny rozwój ucznia/wychowanka (z szczególnym uwzględnieniem specyfiki ucznia szkoły ponadpodstawowej).	KN.2023_U06 KN.2023_W01 KN.2023_W04 KN.2023_W07 KN.2023_W12	4 4 4 4 4
PPsPed_02		Absolwent charakteryzuje się poczuciem odpowiedzialności za własny rozwój zawodowy oraz podejmowane działania pedagogiczne oraz potrafi wyciągać wnioski z obserwacji pracy wychowawcy klasy, jego interakcji z uczniami oraz sposobu, w jaki planuje i przeprowadza zajęcia wychowawcze odpowiednie na etapie szkoły ponadpodstawowej.	KN.2023_U01 KN.2023_U10 KN.2023_U13 KN.2023_U14	4 4 4 4
PPsPed_03		Absolwent ma kompetencje niezbędne do ciągłego doskonalenia jakości swojej pracy, skutecznie korzystając z technologii informacyjno-komunikacyjnych.	KN.2023_U16	4
PPsPed_04		Absolwent jest przygotowany do skutecznego i efektywnego realizowania zadań zawodowych (dydaktycznych,	KN.2023_KS02	4

	wychowawczych i opiekuńczych) wynikających z roli nauczyciela – wychowawcy.	KN.2023_KS03	4
PPsPed_05	Absolwent zna i rozumie zadania charakterystyczne dla szkoły lub placówki systemu oświaty oraz środowisko, w jakim one działają.	KN.2023_W08 KN.2023_W09	4 4
PPsPed_06	Absolwent zna i rozumie zasady zapewniania bezpieczeństwa uczniom w szkole i poza nią.	KN.2023_W11	5
PPsPed_07	Absolwent potrafi wyciągać wnioski z obserwacji sposobu integracji działań opiekuńczo-wychowawczych i dydaktycznych przez nauczycieli przedmiotów.	KN.2023_U03 KN.2023_U04 KN.2023_U06	3 4 4
PPsPed_08	Absolwent potrafi wyciągać wnioski, w miarę możliwości, z bezpośredniej obserwacji pracy rady pedagogicznej i zespołu wychowawców klas.	KN.2023_U01 KN.2023_U03 KN.2023_U06	4 3 3
PPsPed_09	Absolwent potrafi wyciągać wnioski z bezpośredniej obserwacji pozalekcyjnych działań opiekuńczo-wychowawczych nauczycieli, w tym podczas dyżurów na przerwach międzylekcyjnych i zorganizowanych wyjść grup uczniowskich.	KN.2023_U01 KN.2023_U03 KN.2023_U06	4 4 4
PPsPed_10	Absolwent potrafi zaplanować i przeprowadzić zajęcia wychowawcze pod nadzorem opiekuna praktyk zawodowych.	KN.2023_U03 KN.2023_U05 KN.2023_U13	4 3 4
PPsPed_11	Absolwent potrafi analizować, przy pomocy opiekuna praktyk zawodowych oraz nauczycieli akademickich prowadzących zajęcia w zakresie przygotowania psychologiczno-pedagogicznego, sytuacje i zdarzenia pedagogiczne zaobserwowane lub doświadczone w czasie praktyk.	KN.2023_U01 KN.2023_U05 KN.2023_U12	4 4 3
PPsPed_12	Absolwent jest gotów do skutecznego współdziałania z opiekunem praktyk zawodowych i z nauczycielami w celu poszerzania swojej wiedzy.	KN.2023_KS02 KN.2023_KS07	2 4

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*

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**
PPsPed_fns_1	workshop		15	course work	PPsPed_01, PPsPed_02, PPsPed_03, PPsPed_04, PPsPed_05, PPsPed_06, PPsPed_07, PPsPed_08, PPsPed_09, PPsPed_10, PPsPed_11, PPsPed_12	a05

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a05	Preparation for classes	Production/preparation of tools, materials or documentation necessary for class participation *developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes*	Yes
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 optimize participation in classes, including those supplementary to the core subjects listed in the pursued study programme*	Yes
d03	Consulting the results of the verification of learning outcomes	Review of internship documentation *an analysis of the portfolio of documentation obtained during internship, including professional internship, and other practical classes and studio sessions, as well as the documentation developed in order to obtain credit for such classes; verification of the description, necessary attachments, opinions and grades before submitting the portfolio for acceptance*	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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		**Psychological and Pedagogical Workshops**
Module code		W4-MT-N2-23-WPsPed
Number of the ECTS credits		2
Language of instruction		Polish
Purpose and description of the content of education		W ramach modułu realizowane są treści z zakresu pedagogiki niezbędne do uzyskania ogólnego przygotowania psychologiczno-pedagogicznego (zgodnie z wytycznymi zawartymi w Rozporządzeniu Ministra Nauki i Szkolnictwa Wyższego z dnia 25 lipca 2019 r.). Treści realizowane w ramach modułu obejmują: teoretyczne przygotowanie do realizacji praktyki psychologiczno-pedagogicznej, dzięki któremu student pozna sposoby oddziaływań wychowawczych, sposoby konstruowania programów profilaktyczno-wychowawczych, warunki i zasady współpracy nauczyciela z opiekunami ucznia (rodzicami), zasady dobrej komunikacji z rodzicami, projektowanie spotkań (zajęć) zbiorowych i indywidualnych z rodzicami, współdziałanie wychowawcy z innymi instytucjami wspierającymi pracę szkoły (poradnia psychologiczno-pedagogiczna, policja, ośrodek opieki społecznej itp.), zagadnienia pracy wychowawczej z klasą szkolną - analiza cech i procesów społecznych klasy, dyscyplinowanie i motywowanie, komunikacja z grupą uczących się, prowadzenie dokumentacji, projekty zajęć w ramach godzin wychowawczych, planowanie pozalekcyjnych i pozaszkolnych form pracy wychowawczej – wycieczki, zabawy, uroczystości klasowe i szkolne, rolę i zadania nauczyciela jako wychowawcy i opiekuna ucznia w szkole – analiza zakresów pracy dydaktycznej, wychowawczej, opiekuńczej i terapeutycznej, poznanie roli zawodowej nauczyciela wobec innych ról społecznych: rodzica, partnera, obywatela, rozpoznawanie potrzeb uczniów, próba dostrzegania przejawów zaburzeń zachowania wynikających z zaburzeń emocjonalnych, wahań nastrojów, przejawów agresji itp.; bieżącą pomoc w realizacji praktyki psychologiczno-pedagogicznej wynikającą z indywidualnych potrzeb studenta.
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)**
WPsPed_01	absolwent zna znaczenie pozycji szkoły jako instytucji edukacyjnej, funkcje i cele edukacji szkolnej, (B.2.W1.)		KN.2023_W04	2
			KN.2023_W08	2
			KN.2023_W09	2
WPsPed_02	absolwent zna podstawę programową w kontekście programu nauczania oraz działania wychowawczo-profilaktyczne, (B.2.W1.)		KN.2023_W14	4
WPsPed_03	absolwent zna i rozumie rolę nauczyciela, nauczycielską pragmatykę zawodową – prawa i obowiązki nauczycieli, zasady odpowiedzialności prawnej opiekuna, nauczyciela, wychowawcy i za bezpieczeństwo oraz ochronę zdrowia		KN.2023_W03	3
			KN.2023_W04	3

	uczniów, rolę początkującego nauczyciela w szkolnej rzeczywistości, uwarunkowania sukcesu w pracy nauczyciela; (B. 2.W2.)	KN.2023_W11	3
WPsPed_04	absolwent rozumie wychowanie w kontekście rozwoju: ontologiczne, aksjologiczne i antropologiczne podstawy wychowania; istotę i funkcje wychowania oraz proces wychowania, jego strukturę, właściwości i dynamikę; absolwent zna i rozumie pomoc psychologiczno-pedagogiczną w szkole – regulacje prawne, formy i zasady udzielania wsparcia w placówkach systemu oświaty, a także znaczenie współpracy rodziny ucznia i szkoły oraz szkoły ze środowiskiem pozaszkolnym; (B.2.W3.)	KN.2023_W01 KN.2023_W05 KN.2023_W09	3 4 4
WPsPed_05	absolwent zna i rozumie zasady pracy opiekuńczo-wychowawczej nauczyciela: obowiązki nauczyciela jako wychowawcy klasy, metodykę pracy wychowawczej, program pracy wychowawczej, style kierowania klasą, ład i dyscyplinę, poszanowanie godności dziecka, ucznia lub wychowanka, różnicowanie, indywidualizację i personalizację pracy z uczniami (B.2.W4.)	KN.2023_W06	4
WPsPed_06	absolwent zna i rozumie zasady funkcjonowanie klasy szkolnej jako grupy społecznej, procesy społeczne w klasie, stara się rozwiązywać konflikty w klasie lub grupie wychowawczej, animować życie społeczno-kulturalnego klasy, wspierać samorządność i autonomię uczniów, rozwijać u dzieci, uczniów lub wychowanków kompetencje komunikacyjne i umiejętności społeczne niezbędne do nawiązywania poprawnych relacji; (B.2.W4.)	KN.2023_W12	4
WPsPed_07	absolwent zna i rozumie pojęcia integracji i inkluzji; sytuację dziecka z niepełnosprawnością fizyczną i intelektualną w szkole ogólnodostępnej, problemy dzieci z zaburzeniami spektrum autyzmu i ich funkcjonowanie, problemy dzieci zaniedbanych i pozbawionych opieki oraz szkolą sytuację dzieci z oświadczeniem migracyjnym; problematykę dziecka w sytuacji kryzysowej lub traumatycznej; zagrożenia dzieci i młodzieży: zjawiska agresji i przemocy, w tym agresji elektronicznej, oraz uzależnień, w tym od środków psychoaktywnych i komputera, a także zagadnienia związane z grupami nieformalnymi, podkulturami młodzieżowymi i sektami; (B.2.W4.)	KN.2023_W06 KN.2023_W10	4 4
WPsPed_08	absolwent rozumie sytuację uczniów ze specjalnymi potrzebami edukacyjnymi: specjalne potrzeby edukacyjne uczniów i ich uwarunkowania (zakres diagnozy funkcjonalnej, metody i narzędzia stosowane w diagnozie), konieczność dostosowywania procesu kształcenia do specjalnych potrzeb edukacyjnych uczniów (projektowanie wsparcia, konstruowanie indywidualnych programów) oraz tematykę oceny skuteczności wsparcia uczniów ze specjalnymi potrzebami edukacyjnymi; (B.2.W5.)	KN.2023_W05 KN.2023_W06 KN.2023_W07	2 3 3
WPsPed_09	absolwent zna i rozumie zasady pracy z uczniem z trudnościami w uczeniu się; przyczyny i przejawy trudności w uczeniu się, zapobieganie trudnościom w uczeniu się i ich wczesne wykrywanie, specyficzne trudności w uczeniu się – dysleksja, dysgrafia, dysortografia i dyskalkulia oraz trudności w uczeniu się wynikające z dysfunkcji sfery percepcyjno-motorycznej oraz zaburzeń rozwoju zdolności, w tym językowych i arytmetycznych, i sposoby ich przezwyciężania; zasady dokonywania diagnozy nauczycielskiej i techniki diagnostyczne w pedagogice; (B.2.W6.)	KN.2023_W07 KN.2023_W14	3 3
WPsPed_10	absolwent potrafi zdiagnozować potrzeby edukacyjne ucznia i zaprojektować dla niego odpowiednie wsparcie;(B.2.U6)	KN.2023_U01 KN.2023_U03 KN.2023_U05	2 2 2
WPsPed_11	absolwent potrafi wybrać program nauczania zgodny z wymaganiami podstawy programowej i dostosować go do potrzeb edukacyjnych uczniów; (B.2.U1)	KN.2023_U02 KN.2023_U04	2 2
WPsPed_12	absolwent potrafi określić przybliżony potencjał ucznia i pomóc mu w samodzielnym zaprojektowaniu własnej ścieżki rozwoju; (B.2.U7)	KN.2023_U02 KN.2023_U05	2 1
WPsPed_13	absolwent stara się formułować oceny etyczne związane z wykonywaniem zawodu nauczyciela; (B.2.U3)	KN.2023_U06 KN.2023_U10	2 3

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WPsPed_14	absolwent jest gotów do okazywania empatii uczniom oraz zapewniania im wsparcia i pomocy; (B.2.K1)	KN.2023_KS02	2
WPsPed_15	absolwent jest gotów do profesjonalnego rozwiązywania konfliktów w klasie szkolnej lub grupie wychowawczej; (B.2.K2)	KN.2023_KS01 KN.2023_KS03	3 2
WPsPed_16	absolwent jest gotów do samodzielnego pogłębiania wiedzy pedagogicznej; (B.2.K3)	KN.2023_U18	2
WPsPed_17	absolwent jest gotów do współpracy z nauczycielami i specjalistami w celu doskonalenia swojego warsztatu pracy; (B.2.K4)	KN.2023_KS07	2

9.	Methods of conducting classes	
Code	**Category**	**Name (description)**
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*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*
f03	Methods of self-learning	Conceptual work *a (mainly intellectual) activity carried out independently (or in a selected group) resulting in the creation of a concept, idea or project; creating a plan based on a vision; developing a general outline of a project; producing a simplified sketch of the variant versions of a procedure/product/work*

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
WPPed_fns_1	workshop	30	course work	WPsPed_01, WPsPed_02, WPsPed_03, WPsPed_04, WPsPed_05, WPsPed_06, WPsPed_07, WPsPed_08, WPsPed_09, WPsPed_10, WPsPed_11, WPsPed_12, WPsPed_13, WPsPed_14, WPsPed_15, WPsPed_16, WPsPed_17	b07, b08, f02, f03

11.	The student's work, apart from participation in classes, includes in particular:		
Code	Category	Name (description)	Is it part of the BUNA?
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	No
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
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
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	Yes
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
c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/ examination completion *a set of activities aimed at performing an assigned task, to be executed out of class, as an obligatory phase/element of the verification of the learning outcomes assigned to the course*	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
d02	Consulting the results of the verification of	Development of a corrective action plan as well as supplementary/corrective tasks	Yes

	learning outcomes	*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*	

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.

University of Silesia in Katowice

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Psychology
Module code		W4-MT-N2-23-Psy
Number of the ECTS credits		2
Language of instruction		Polish
Purpose and description of the content of education		W ramach modułu realizowane są podstawowe treści z zakresu psychologii niezbędne do uzyskania ogólnego przygotowania psychologicznego do pracy w zawodzie nauczyciela (zgodnie z wytycznymi zawartymi w Rozporządzeniu Ministra Nauki i Szkolnictwa Wyższego z dnia 25 lipca 2019 r.) Celem merytorycznym zajęć jest doskonalenie u studentów na podstawie podstawowej problematyki oraz terminologii psychologicznej, głównych koncepcji, dziedzin i pojęć psychologii umiejętności rozumienia funkcjonowania człowieka. Baza psychologiczna stanowi podstawę kompetencji w zakresie diagnozowania i zapobiegania różnorodnym niepożądanym zjawiskom towarzyszącym uczeniu się. Praktycznym celem zajęć jest doskonalenie własnych umiejętności kluczowych istotnych dla wspierania wszechstronnego i prawidłowego rozwoju ucznia, dla rozpoznawania i rozwoju własnych zasobów.
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)
Psy_01	Absolwent zna i rozumie emocje i motywacje w procesach regulacji zachowania, zdolności i uzdolnienia; psychologię różnic indywidualnych – różnice w zakresie inteligencji, temperamentu, osobowości i stylu poznawczego. Rozumie wartość integralnego rozwoju człowieka.	KN.2023_W01	2
Psy_02	Absolwent zna i rozumie rozwój wybranych funkcji psychicznych, normę rozwojową, rozwój i kształtowanie osobowości, rozwój w kontekście wychowania, zaburzenia w rozwoju podstawowych procesów psychicznych, teorie integralnego rozwoju ucznia, dysharmonie i zaburzenia rozwojowe u uczniów, zaburzenia zachowania, zagadnienia: nieśmiałości i nadpobudliwości, szczególnych uzdolnień, zaburzeń funkcjonowania w okresie dorastania, obniżenia nastroju, depresji, krystalizowania się tożsamości, dorosłości, identyfikacji z nowymi rolami społecznymi, a także kształtowania się stylu życia.	KN.2023_W02 KN.2023_W03 KN.2023_W13	5 2 3
Psy_03	Absolwent zna bariery w komunikowaniu się, media i ich wpływ wychowawczy, style komunikowania się uczniów i nauczyciela, bariery w komunikowaniu się w klasie, różne formy komunikacji − autoprezentację, aktywne słuchanie, efektywne nadawanie, komunikację niewerbalną, porozumiewanie się emocjonalne w klasie, porozumiewanie się w sytuacjach konfliktowych, porozumiewanie się ludzi w instytucjach, reguły współdziałania, procesy komunikowania się;	KN.2023_W04	2

Psy_04	Absolwent zna metody i techniki identyfikacji oraz wspomagania rozwoju uzdolnień i zainteresowań, bariery i trudności w procesie komunikowania się, techniki i metody usprawniania komunikacji z uczniem oraz między uczniami, metody i techniki uczenia się z uwzględnieniem rozwijania metapoznania;	KN.2023_W02 KN.2023_W13 KN.2023_W14	4 4 4
Psy_05	Absolwent potrafi skutecznie i świadomie komunikować się; porozumieć się w sytuacji konfliktowej; rozpoznawać bariery i trudności uczniów w procesie uczenia się, komunikowania się oraz w funkcjonowaniu społecznym, w tym uwarunkowane czynnikami środowiskowymi; rozpoznawać potrzeby psychospołecznego wsparcia ucznia.	KN.2023_U01 KN.2023_U03 KN.2023_U09	3 4 3
Psy_06	Absolwent potrafi zaplanować działania na rzecz własnego rozwoju zawodowego na podstawie świadomej autorefleksji i informacji zwrotnej od innych osób;	KN.2023_U01 KN.2023_U04	4 3
Psy_07	Absolwent jest gotów do poszukiwania nowych zasobów wzbogacających treści nauczania	KN.2023_KS01 KN.2023_KS04	4 3
Psy_08	Absolwent zna i rozumie zagadnienia autorefleksji i samorozwoju: zasoby własne w pracy nauczyciela – identyfikacja i rozwój, indywidualne strategie radzenia sobie z trudnościami, stres i nauczycielskie wypalenie zawodowe.	KN.2023_W03	4
Psy_09	Absolwent jest gotów do autorefleksji nad własnym rozwojem zawodowym.	KN.2023_KS07	3
Psy_10	Absolwent jest gotów do wykorzystania zdobytej wiedzy psychologicznej do analizy zdarzeń pedagogicznych.	KN.2023_KS01	3

9.	Methods of conducting classes	
Code	**Category**	**Name (description)**
a01	Lecture methods / expository methods	Formal lecture/ course-related lecture *a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided*
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*
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*
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.*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

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**
Psy_fns_1	lecture	15	course work	Psy_01, Psy_02, Psy_03, Psy_04, Psy_05, Psy_06, Psy_07, Psy_08, Psy_09, Psy_10	a01, c07
Psy_fns_2	discussion classes	15	course work	Psy_01, Psy_02, Psy_03, Psy_04, Psy_05, Psy_06, Psy_07, Psy_09, Psy_10	b08, c07, d02, f02

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	No
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
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
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	Yes
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
c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/examination completion *a set of activities aimed at performing an assigned task, to be executed out of class, as an obligatory phase/element of the verification of the learning outcomes assigned to the course*	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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Robotics - laboratory
Module code		W4-MT-N2-23-PRobIn
Number of the ECTS credits		2
Language of instruction		Polish
Purpose and description of the content of education		
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)
PRobIn1	Student zna pojęcia związane z budową robotów, różnymi czujnikami ich zastosowaniem oraz programowaniem.		K_U07	2
PRobin2	Student potrafi pracować w zespole oraz organizować jego pracę oraz szanuje pracę innych osób z zespołu.		K_K03	1
			K_U10	1
			K_W06	1
PRobin3	Student widzi potrzebę dokształcania się w dziedzinie nowych technologii.		K_K01	5

9.	Methods of conducting classes	
Code	Category	Name (description)
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*

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*
d03	Programmed learning methods	Working with another teaching tool *e.g. using websites in any way or according to the rules set by the teacher; or making use of other subject-specific tools*
e06	Practical methods	Observation *also conducted as fieldwork; a method of watching phenomena, objects or people in a systematic/planned way in order to gain knowledge about them; perceptual separation of elements of a model action as an element of learning through imitation; a complex system of cognition based on sensory experiences*
e07	Practical methods	Simulation *an indirect method; imitating reality in order to gain experience approximating a real one; recreating a real-world situation so that its participant can acquire an experience close to the authentic one; work on "replacement" material*
f03	Methods of self-learning	Conceptual work *a (mainly intellectual) activity carried out independently (or in a selected group) resulting in the creation of a concept, idea or project; creating a plan based on a vision; developing a general outline of a project; producing a simplified sketch of the variant versions of a procedure/product/work*

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
PRobinN	laboratory classes	15	course work	PRobIn1, PRobin2, PRobin3	b07, b08, d01, d03, e06, e07, f03

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

Code	Category	Name (description)	Is it part of the BUNA?
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	Yes
a05	Preparation for classes	Production/preparation of tools, materials or documentation necessary for class participation *developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes*	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.*	Yes
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

c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/ examination completion *a set of activities aimed at performing an assigned task, to be executed out of class, as an obligatory phase/element of the verification of the learning outcomes assigned to the course*	Yes
e01	Activities complementary to the classes	Undertaking, on one's own initiative and individually, activities aimed at expanding the scope or depth of the teaching content, also beyond the walls of the University *a set of activities undertaken independently and on the student's own initiative, aimed at expanding the depth and scope of knowledge and skills, their revision and repetition, retention or verification, also activities carried outside the university, e.g., in a culture promoting or educational institution, a laboratory, in the open air, etc.; also self-education*	No

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Robotics for teachers
Module code		W4-MT-N2-23-RobNMat
Number of the ECTS credits		2
Language of instruction		Polish
Purpose and description of the content of education		Zajęcia mają na celu zaznajomieni studentów z programowaniem robotów zbudowanych z LEGO MINDSTORMS lub Arduino. Głównym zadaniem jest ukazanie korelacji matematyki, fizyki i programowania na różnych etapach edukacyjnych i pokazanie możliwości wykorzystania robotyki jako narzędzia ułatwiającego pracę z uczniem.
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)**
RobNMatN1		Student zna pojęcia związane z budową robotów, różnymi czujnikami ich zastosowaniem oraz programowaniem.	K_U07	2
RobNMatN2		Student potrafi pracować w zespole oraz organizować jego pracę. Szanuje pracę innych osób z zespołu.	K_K03	1
			KN.2023_KS07	1
			K_U10	1
			K_W06	1
RobNMatN3		Student potrafi wykorzystać elementy robotyki w nauczaniu matematyki oraz zorganizować zajęcia dla dzieci z różnymi potrzebami edukacyjnymi.	KN.2023_U02	3
			KN.2023_U03	3
			KN.2023_U06	3
			KN.2023_U07	3
			KN.2023_U12	3
			KN.2023_U15	3
			KN.2023_W05	1
			KN.2023_W06	1
			KN.2023_W15	1

| RobNMatN4 | Student widzi potrzebę dokształcania się w dziedzinie nowych technologii. | K_K01 | 5 |
| | | KN.2023_U18 | 5 |

9.	Methods of conducting classes	
Code	**Category**	**Name (description)**
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*
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*
d03	Programmed learning methods	Working with another teaching tool *e.g. using websites in any way or according to the rules set by the teacher; or making use of other subject-specific tools*
e06	Practical methods	Observation *also conducted as fieldwork; a method of watching phenomena, objects or people in a systematic/planned way in order to gain knowledge about them; perceptual separation of elements of a model action as an element of learning through imitation; a complex system of cognition based on sensory experiences*
e07	Practical methods	Simulation *an indirect method; imitating reality in order to gain experience approximating a real one; recreating a real-world situation so that its participant can acquire an experience close to the authentic one; work on "replacement" material*
f03	Methods of self-learning	Conceptual work *a (mainly intellectual) activity carried out independently (or in a selected group) resulting in the creation of a concept, idea or project; creating a plan based on a vision; developing a general outline of a project; producing a simplified sketch of the variant versions of a procedure/product/work*

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**
RobNMatN	laboratory classes	15	course work	RobNMatN1, RobNMatN2, RobNMatN3, RobNMatN4	b07, b08, d01, d03, e06, e07, f03

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the*	Yes

		range of activities indicated in it as required for full participation in classes	
a05	Preparation for classes	Production/preparation of tools, materials or documentation necessary for class participation *developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes*	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.*	Yes
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
c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/ examination completion *a set of activities aimed at performing an assigned task, to be executed out of class, as an obligatory phase/element of the verification of the learning outcomes assigned to the course*	Yes
e01	Activities complementary to the classes	Undertaking, on one's own initiative and individually, activities aimed at expanding the scope or depth of the teaching content, also beyond the walls of the University *a set of activities undertaken independently and on the student's own initiative, aimed at expanding the depth and scope of knowledge and skills, their revision and repetition, retention or verification, also activities carried outside the university, e.g., in a culture promoting or educational institution, a laboratory, in the open air, etc.; also self-education*	No

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Selected problems of school mathematics in tasks
Module code		W4-MT-N2-23-WZMSzk
Number of the ECTS credits		3
Language of instruction		Polish
Purpose and description of the content of education		Intencją modułu jest pogłębienie rozumienia przez studentów treści programowych w zakresie matematyki szkoły ponadpodstawowej w stopniu umożliwiającym im osiągnięcie biegłości w rozwiązywaniu zadań matematycznych na poziomie rozszerzonym pozwalającej im na swobodne adaptowanie metod pracy z uczniem i wybór rozwiązań metodycznych dostosowanych do potrzeb i możliwości uczniów.
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)
WZMSzk_01		Student zna i rozumie metodykę realizacji poszczególnych treści kształcenia w obrębie matematyki – rozwiązania merytoryczne i metodyczne, dobre praktyki, dostosowanie oddziaływań do potrzeb i możliwości uczniów o różnym potencjale i stylu uczenia się.	KN.2023_U02 KN.2023_U04 KN.2023_W02 KN.2023_W14 KN.2023_W15	3 3 3 3 3
WZMSzk_02		Student zna, rozumie i potrafi rozpoznać typowe dla matematyki błędy uczniowskie, ich rolę i sposoby wykorzystania w procesie dydaktycznym.	KN.2023_U01 KN.2023_U10 KN.2023_W02 KN.2023_W04 KN.2023_W14	4 4 4 4 4
WZMSzk_03		Student zna i rozumie metody kształcenia w odniesieniu do nauczanego przedmiotu lub prowadzonych zajęć, a także znaczenie kształtowania postawy odpowiedzialnego i krytycznego wykorzystywania mediów cyfrowych oraz poszanowania praw własności intelektualnej, jest również gotów do adaptowania metod pracy do potrzeb i różnych stylów uczenia się uczniów.	KN.2023_U02 KN.2023_U06 KN.2023_W02 KN.2023_W15	4 4 4 4

WZMSzk_04	Student potrafi identyfikować typowe zadania szkolne z celami kształcenia, w szczególności z wymaganiami ogólnymi podstawy programowej, oraz z kompetencjami kluczowymi.	KN.2023_U02	3
		KN.2023_U04	3
		KN.2023_W14	3
WZMSzk_05	Student jest gotów do stymulowania uczniów do uczenia się przez całe życie przez samodzielną pracę.	KN.2023_U06	4
		KN.2023_U10	4
		KN.2023_W02	4
		KN.2023_W03	4

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*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

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**
WZMSzk_01	discussion classes	30	course work	WZMSzk_01, WZMSzk_02, WZMSzk_03, WZMSzk_04, WZMSzk_05	b02, f02

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	Yes
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)*	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

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.

1.	Field of study	**Mathematics**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	**General information about the module**	
Module name	**Specialized Module**
Module code	W4-MT-N2-23-MSpe
Number of the ECTS credits	6
Language of instruction	Polish
Purpose and description of the content of education	Opis zawartości modułu 'Wykład specjalistyczny'. 1. Zapoznanie studenta z rolą i miejscem problematyki wykładu w historycznym rozwoju matematyki i nauk pokrewnych. 2. Wprowadzenie podstawowych pojęć i definicji teorii omawianej na wykładzie. 3. Sformułowanie i udowodnienie twierdzeń danego wykładu specjalistycznego. 4. Pokazanie możliwości stosowania zdobytej wiedzy teoretycznej do rozwiązywania problemów wywodzących się z zastosowań. 5. Wskazanie powiązań omawianych zagadnień z pokrewnymi dziedzinami nauk przyrodniczych. 6. Omówienie metod numerycznych stosowanych do rozwiązywania wybranych zagadnień matematycznych w naukach przyrodniczych. 7. Omówienie możliwych kierunków rozwoju problematyki wykładu i ich znaczenia dla nauki i postępu cywilizacyjnego.
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)
MSpe_1	Ma ogólną wiedzę w zakresie zaawansowanych kompetencji, zasad i teorii omawianych na danym wykładzie specjalistycznym	K_W04	5
MSpe_2	Ma rozszerzoną wiedzę w zakresie zagadnień omawianych na danym wykładzie specjalistycznym	K_U06 K_W04	4 5
MSpe_3	Potrafi opisać historyczny rozwój i określić znaczenie omawianych na wykładzie zagadnień dla postępu nauk przyrodniczych	K_U08 K_W05	5 3
MSpe_4	Potrafi analizować problemy oraz znajdować ich rozwiązania w oparciu o poznane na wykładzie twierdzenia I metody badawcze.	K_K02 K_U05	5 4
MSpe_5	Potrafi stosować metody numeryczne do rozwiązywania problemów omawianych na wykładzie	K_U05	3

| MSpe_6 | Potrafi zastosować zdobytą wiedzę do zagadnień pokrewnych z omawianymi na wykładzie | K_K06 | 3 |
| | | K_U07 | 4 |

9.	Methods of conducting classes	
Code	**Category**	**Name (description)**
a01	Lecture methods / expository methods	Formal lecture/ course-related lecture *a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided*
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*

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**
MSpe_fns_1	lecture	15	exam	MSpe_1, MSpe_2, MSpe_3, MSpe_4, MSpe_5, MSpe_6	a01
MSpe_fns_2	laboratory classes	15	course work	MSpe_1, MSpe_2, MSpe_3, MSpe_4, MSpe_5, MSpe_6	b08

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	Yes
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*	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	
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	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*	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*	No
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*	No

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		Statistics
Module code		W4-MT-N2-23-Stat
Number of the ECTS credits		6
Language of instruction		Polish
Purpose and description of the content of education		Moduł Statystyka ma na celu wykształcenie umiejętności konstrukcji modeli statystycznych, ich wszechstronnej analizy statystycznej oraz doskonalenie znajomości komputerowych pakietów statystycznych. Przewiduje się realizację następujących treści programowych: 1. Organizacja badań statystycznych: gromadzenie danych, opracowanie i graficzna prezentacja danych. 2. Parametryczne testy istotności dotyczące dwóch i wielu prób. 3. Nieparametryczne testy istotności dla dwóch i wielu prób. 4. Testy zgodności. 5. Liniowe i nieliniowe modele statystyczne – estymacja i testowanie hipotez statystycznych. 6. Zastosowanie liniowych i nieliniowych modeli statystycznych w ekonometrii i finansach. 7. Wykorzystanie pakietów statystycznych do estymacji parametrów i weryfikacji hipotez.
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)
Stat_1	Posiada pogłębioną wiedzę z elementów statystyki opisowej, estymacji i wnioskowania statystycznego	K_W04	4
Stat_2	Dobrze rozumie rolę i sposoby budowy modeli statystycznych	K_W02	2
Stat_3	Potrafi wykorzystać pakiety statystyczne do gromadzenia, opisu i analizy danych statystycznych	K_U05	3
Stat_4	Zna co najmniej jeden pakiet statystyczny, służący do obróbki danych statystycznych i ich analizy	K_W05	3
Stat_5	Umie konstruować modele statystyczne i stawiać hipotezy statystyczne odpowiadające hipotezom badawczym	K_U01	3
Stat_6	Potrafi opisywać i interpretować wyniki analiz statystycznych	K_U02	3
Stat_7	Umie prowadzić pogłębione wnioskowania statystyczne oraz sprawdzać poprawność tych wnioskowań	K_U03	3
Stat_8	Orientuje się w klasycznych metodach statystyki (estymacja i testowanie hipotez) oraz w tematyce statystycznej obróbki danych	K_W01	4

9.	Methods of conducting classes		
Code	**Category**		**Name (description)**
a01	Lecture methods / expository methods		Formal lecture/ course-related lecture *a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided*
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*
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*
f02	Methods of self-learning		Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

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**
Stat_fns_1	lecture		15	exam	Stat_1, Stat_2, Stat_7	a01, f02
Stat_fns_2	laboratory classes		15	course work	Stat_3, Stat_4, Stat_5, Stat_6, Stat_8	d01, e01

11.	The student's work, apart from participation in classes, includes in particular:			
Code	**Category**		**Name (description)**	**Is it part of the BUNA?**
a01	Preparation for classes		Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	No
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
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
a05	Preparation for classes		Production/preparation of tools, materials or documentation necessary for class participation	No

		developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes	
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	Yes
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.	Yes
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes 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.	Yes
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

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module

Module name	Stochastic Methods
Module code	W4-MT-N2-23-MSto
Number of the ECTS credits	6
Language of instruction	Polish
Purpose and description of the content of education	Moduł Metody stochastyczne ma na celu wykształcenie umiejętności: postrzeganie teorii prawdopodobieństwa i teorii procesów stochastycznych jako narzędzia opisu modeli matematyki finansowej, ekonomicznych, fizycznych i biologicznych oraz stosowania metod stochastycznych przy rozwiązywaniu problemów praktycznych z różnych dziedzin. Treści programowe modułu:
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)
MSto _1	posiada pogłębioną wiedzę z zakresu podstawowych działów matematyki	K_W01	3
MSto _2	dobrze rozumie rolę i znaczenie konstrukcji rozumowań matematycznych	K_W02	2
MSto _3	zna podstawy modelowania stochastycznego w naukach ekonomicznych lub naukach przyrodniczych	K_U07	2
MSto _4	posiada umiejętności wyrażania treści matematycznych, w mowie i na piśmie, w tekstach matematycznych o różnym charakterze	K_U05	2
MSto _5	posiada umiejętność sprawdzania poprawności wnioskowania w budowaniu dowodów formalnych	K_U03	4
MSto _6	zna podstawowe rozkłady probabilistyczne i ich własności; potrafi je stosować w zagadnieniach praktycznych	K_W04	2
MSto_7	rozpoznaje struktury matematyczne w wybranych teoriach nauk przyrodniczych	K_W04	1
MSto_8	potrafi stosować procesy stochastyczne jako narzędzie do modelowania zjawisk i analizy ich ewolucji	K_U07	3

9.	Methods of conducting classes

Code	Category	Name (description)
a01	Lecture methods / expository methods	Formal lecture/ course-related lecture *a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided*

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*
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*

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
MSto_fns_1	lecture	15	course work	MSto _1, MSto _2, MSto _3, MSto _6, MSto_7, MSto_8	a01
MSto_fns_2	discussion classes	15	course work	MSto _1, MSto _2, MSto _3, MSto _4, MSto _5, MSto _6, MSto_7, MSto_8	b08, 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 *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
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
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.*	Yes
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	Yes
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*	Yes

		well as from the notes or other materials/artifacts made in class	

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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		**Team Project**
Module code		W4-MT-N2-23-PZes
Number of the ECTS credits		3
Language of instruction		Polish
Purpose and description of the content of education		W ramach tego modułu studenci, podzieleni na kilkuosobowe zespoły, realizują projekty związane z zadanym zagadnieniem. Na realizację projektu składa się kilka faz: 1. Planowanie realizacji projektu. Przydział ról i zadań w zespole. 2. Przegląd dostępnej literatury dotyczącej danego zagadnienia. 3. Analiza problemu, poszukiwanie metod jego rozwiązania. 4. Implementacja rozwiązania. Ta faza, w zależności od projektu, powinna zawierać takie elementy jak analiza danych empirycznych, kalibracja, symulacje czy testowanie rozwiązania. 5. Przygotowanie raportu z projektu oraz prezentacja wyników. Oceniane są zarówno efekt końcowy jak i poszczególne fazy realizacji projektu. Zajęcia laboratoryjne służą raportowaniu i omawianiu postępów prac, dyskusji dydaktycznej oraz dają możliwość uzyskania pomocy w realizacji projektu.
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)
PZes_1	potrafi stosować metody obliczeniowe i techniki informatyczne do rozwiązywania typowych problemów matematycznych	K_U05	4
PZes_2	potrafi opracować oraz przedstawić wyniki badań, w postaci pisemnej oraz ustnie	K_U05	4
PZes_3	potrafi odnajdywać niezbędne informacje w literaturze fachowej i innych wiarygodnych źródłach	K_U06 K_U08	2 3
PZes_4	potrafi stosować zdobytą wiedzę matematyczną do rozwiązywania problemów z zakresu zastosowań matematyki	K_U04	4
PZes_5	potrafi zidentyfikować i uzupełnić braki we własnej wiedzy dotyczące danego zagadnienia	K_K02	4
PZes_6	potrafi pracować w zespole pełniąc w nim różne funkcje	K_K07	3
PZes_7	potrafi systematycznie pracować nad zaplanowanym na dłuższy okres projektem	K_K07	3

PZes_8	potrafi krytycznie ustosunkować się do cudzych i własnych metod oraz wyników	K_K05	3
		K_K06	1

9.	**Methods of conducting classes**	

Code	Category	Name (description)
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*
c01	Demonstration methods	Exhibition *preparing an object for public display and displaying it in order to elicit a specific reaction; creating a themed collection of specimens/objects/works to illustrate a specific issue*
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*

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
PZes	workshop	15	course work	PZes_1, PZes_2, PZes_3, PZes_4, PZes_5, PZes_6, PZes_7, PZes_8	b08, c01, e01

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

Code	Category	Name (description)	Is it part of the BUNA?
a01	Preparation for classes	Search for materials and review activities necessary for class participation *reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes*	Yes
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*	Yes
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
a05	Preparation for classes	Production/preparation of tools, materials or documentation necessary for class participation *developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes*	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 | 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.

University of Silesia in Katowice

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2023/2024 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	General information about the module	
Module name		**Workshops on mathematical modelling and computer simulation**
Module code		W4-MT-N2-23-WPMSKom
Number of the ECTS credits		2
Language of instruction		Polish
Purpose and description of the content of education		Celem wiodącym modułu jest kształcenie umiejętności analitycznych (np. budowanie modeli matematycznych wybranych problemów z dziedzin stosowanych). Celami pośrednimi są kształcenie umiejętności metodycznych (np. wykorzystanie dostępnej technologii w celu przygotowania projektu, bądź analizy), kształcenie umiejętności poznawczych (np. analiza danych/treści źródłowych podanych w formie artykułów i podręczników, także obcojęzycznych), kształcenie umiejętności interpretacji i prezentacji otrzymanych wyników oraz kształcenie umiejętności pracy zespołowej (np. praca w małych grupach w czasie warsztatów i poza nimi).
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)**
WPMSKom_1	Zna i rozumie najnowsze odkrycia i kierunki rozwoju wybranych teorii matematycznych.		K_W05	2
WPMSKom_2	Potrafi konstruować modele matematyczne, wykorzystywane w konkretnych zastosowaniach matematyki.		K_U07	5
WPMSKom_3	Potrafi przeprowadzić symulację komputerową za pomocą wybranego programu.		K_U07 K_U09	4 5
WPMSKom_4	Zna zaawansowane techniki obliczeniowe, wspomagające pracę matematyka i rozumie ich ograniczenia		K_K05 K_U07	2 4
WPMSKom_5	Zna metody stosowane do przybliżonego rozwiązywania problemów z dziedzin stosowanych		K_K05 K_U07	2 3
WPMSKom_6	Jest gotów do wyciągania wniosków służących pogłębieniu zrozumienia danego tematu		K_K01 K_K02 K_K06	3 3 4
WPMSKom_7	Potrafi przeprowadzić prezentację z osiągniętych wyników		K_U09	5

9.	Methods of conducting classes	
Code	**Category**	**Name (description)**
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**
WPMSKom_fns_1	laboratory classes	15	course work	WPMSKom_1, WPMSKom_2, WPMSKom_3, WPMSKom_4, WPMSKom_5, WPMSKom_6, WPMSKom_7	d01

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*	Yes
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
a05	Preparation for classes	Production/preparation of tools, materials or documentation necessary for class participation *developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes*	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 optimize participation in classes, including those supplementary to the core subjects listed in the pursued study programme*	No

c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes *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.*	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*	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*	No
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*	No

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.