1.	**Field of study**	**Mathematics**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Advanced Inorganic Chemistry**
Module code	W4-MT-S2-23-ZChN
Number of the ECTS credits	3
Language of instruction	Polish
Purpose and description of the content of education	Moduł Zaawansowana chemia nieorganiczna ma za zadanie rozszerzyć wiedzę studenta na temat związków nieorganicznych bloku p i d. Student zapoznaje się z nomenklaturą, sposobem otrzymywania i właściwościami związków nieorganicznych opartych na metalach bloku f. Szczególnym aspektem tego modułu będzie rozwinięcie wiedzy studenta z zakresu nowoczesnych metod badań i identyfikacji związków nieorganicznych.
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)
ZChN_01	Zna nomenklaturę, budowę i właściwości związków nieorganicznych opartych na metalach bloku f.	KN_Ch_W01	3
ZChN_02	Zna nowoczesne metody badań związków nieorganicznych.	KN_Ch_U04 KN_Ch_W03	4 4
ZChN_03	Potrafi samodzielne wyszukiwać informacje w literaturze w celu podnoszenia kompetencji zawodowych i osobistych.	KN_Ch_K01 KN_Ch_U07	4 4
ZChN_04	Odpowiada za bezpieczeństwo pracy własnej i innych.	KN_Ch_U06 KN_Ch_W06	4 4
ZChN_05	Opracowuje raporty i sprawozdania z zakresu syntezy i eksperymentalnych metod analizy i identyfikacji związków nieorganicznych bloku p, d i f.	KN_Ch_U05	4
ZChN_06	Rozumie znaczenie chemii nieorganicznej dla rozwoju techniki oraz dostrzega jej interdyscyplinarny charakter jako nauki.	KN_Ch_U07 KN_Ch_W02	5 5

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*
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*

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**
ZChN_fs_01	workshop	30	course work	ZChN_01, ZChN_02, ZChN_03, ZChN_04, ZChN_05, ZChN_06	a02, 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?**
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Advanced Programming**
Module code	W4-MT-S2-23-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)
PZawS2_1	Student potrafi pisać programy przetwarzające pliki oraz komunikujące się poprzez standardowe wejście i wyjście.	KN_NI_U04 KN_NI_U05 KN_NI_W06 KN_NI_W07	3 5 5 3
PZawS2_2	Student ma uporządkowaną wiedzę w zakresie składni języka wysokiego poziomu. Student zna w stopniu podstawowym zasady konstruowania programów wielomodułowych.	KN_NI_U04 KN_NI_U05 KN_NI_W06 KN_NI_W07	3 5 5 3
PZawS2_3	Student zna podstawowe pojęcia związane z programowaniem obiektowym.	KN_NI_U04 KN_NI_U05	3 5

		KN_NI_W06 KN_NI_W07	5 3
PZawS2_4	Student potrafi współpracować w zespole pracującym nad różnymi aspektami tego samego projektu.	K_K03	3

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	PZawS2_1, PZawS2_2, PZawS2_3	b01
PZaw_fs_02	laboratory classes	45	course work	PZawS2_1, PZawS2_2, PZawS2_3, PZawS2_4	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Algebra and Geometry**
Module code	W4-MT-S2-23-AGeo
Number of the ECTS credits	4
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 2
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Algorithms and data structures**
Module code	W4-MT-S2-23-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	KN_NI_U05 KN_NI_W04	5 3
AiSD_2	zna podstawowe własności algorytmów; prezentuje przykłady zastosowań algorytmiki w innych dziedzinach nauki	KN_NI_W04	3
AiSD_3	zna i rozumie pojęcie złożoności obliczeniowej (czasowej i pamięciowej) oraz notacji asymptotycznej	KN_NI_W04	3
AiSD_4	porównuje działanie różnych algorytmów dla wybranego problemu, analizuje algorytmy na podstawie ich gotowych	KN_NI_U04	5

	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	KN_NI_U04 KN_NI_W04	4 4
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	KN_NI_W04	4
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	KN_NI_U04 KN_NI_U05	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*
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Analytical Chemistry**
Module code	W4-MT-S2-23-ChA
Number of the ECTS credits	7
Language of instruction	Polish
Purpose and description of the content of education	Moduł Chemia analityczna ma za zadanie zapoznanie studentów z podstawowymi pojęciami z zakresu klasycznej chemii analitycznej jakościowej i ilościowej. Student poznaje podstawy teoretyczne w zakresie niezbędnym do zrozumienia zjawisk zachodzących podczas prowadzenia oznaczeń analitycznych: równowagi kwasowo-zasadowe, jonowe i redoksowe, warunki strącania osadów, mechanizmy towarzyszące tworzeniu osadów. Zna podstawowe działy klasycznej analizy ilościowej, potrafi przeprowadzić analizę chemiczną i wykonać obliczenia z zakresu analizy ilościowej.
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)
ChA_01	Ma wiedzę dotyczącą równowag chemicznych w roztworach wodnych.	KN_Ch_K01 KN_Ch_W01	3 3
ChA_02	Rozumie zasady etyki pracy w laboratorium analitycznym.	KN_Ch_K02	4
ChA_03	Zna metody klasycznej analizy jakościowej wybranych kationów i anionów.	KN_Ch_W01	4
ChA_04	Zna wagowe i miareczkowe metody analizy chemicznej.	KN_Ch_W01 KN_Ch_W03	5 5
ChA_05	Wykonuje obliczenia w zakresie chemii analitycznej.	KN_Ch_W01 KN_Ch_W05	4 4
ChA_06	Opracowuje sprawozdania z zakresu analizy ilościowej i jakościowej.	KN_Ch_U02 KN_Ch_U05 KN_Ch_W05	4 4 3
ChA_07	Potrafi przygotować roztwory wzorcowe i przeprowadzić analizę jakościową i ilościową wybranych analitów.	KN_Ch_W06	4

ChA_08	Potrafi posługiwać się szkłem i sprzętem stosowanym w laboratorium analitycznym.	KN_Ch_U06 KN_Ch_W06	4 4
ChA_09	Ma świadomość odpowiedzialności za wspólnie realizowane zadania, związane z pracą zespołową oraz za bezpieczeństwo pracy w laboratorium analitycznym.	KN_Ch_K01 KN_Ch_U06 KN_Ch_W06	4 5 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*
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*
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*
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**
ChA_fs_01	lecture	15	exam	ChA_01, ChA_03, ChA_04	a01, b02, f01
ChA_fs_02	laboratory classes	45	course work	ChA_02, ChA_03, ChA_04, ChA_05, ChA_06, ChA_07, ChA_08, ChA_09	e01
ChA_fs_03	workshop	30	course work	ChA_01, ChA_03, ChA_04, ChA_05	b02, 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?**
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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Applications of GeoGebra in teaching mathematics**
Module code	W4-MT-S2-23-ZGeog
Number of the ECTS credits	1
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 4 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
ZGeog	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*	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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Applied Chemistry and Chemicals Management**
Module code	W4-MT-S2-23-ChSiZCh
Number of the ECTS credits	2
Language of instruction	Polish
Purpose and description of the content of education	Przedmiot "Chemia stosowana i zarządzanie chemikaliami" został zaprojektowany w celu przygotowania studentów do nauczania chemii na poziomie szkół średnich. Skupia się na praktycznych zastosowaniach chemii oraz aspektach związanych z bezpieczeństwem i zarządzaniem substancjami chemicznymi. W trakcie zajęć studenci będą zgłębiać różnorodne obszary chemii stosowanej i ich praktyczne zastosowanie w różnych dziedzinach, takich jak przemysł, medycyna, rolnictwo i ochrona środowiska. Będą zdobywać wiedzę na temat kluczowych pojęć chemicznych, reakcji chemicznych, struktury atomu i układu okresowego oraz zrozumieją, jak te aspekty mają zastosowanie w rzeczywistych sytuacjach. Dodatkowo, studenci będą się również skupiać na zagadnieniach związanych z bezpieczeństwem i zarządzaniem substancjami chemicznymi. Nauczą się oceny ryzyka, klasyfikacji i etykietowania substancji chemicznych oraz praktycznych procedur postępowania, przechowywania, transportu i usuwania substancji chemicznych. W ramach tego przedmiotu zostaną zapoznani z obowiązującymi przepisami i regulacjami dotyczącymi substancji chemicznych w kontekście nauczania i pracy w laboratorium. Podczas zajęć wykorzystane zostaną różnorodne metody dydaktyczne, takie jak wykłady, prezentacje multimedialne, studia przypadków oraz ćwiczenia praktyczne. Studenci będą mieli okazję doświadczyć i zastosować swoją wiedzę w praktyce, co pomoże im w przyszłości efektywnie nauczać chemii, dbając o bezpieczeństwo i odpowiedzialne obchodzenie się z substancjami chemicznymi.
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)**
ChSiZCh_01	Ma wiedzę na temat kluczowych zagadnień związanych z chemią stosowaną i zarządzaniem chemikaliami.	KN_Ch_W04	2
ChSiZCh_02	Zna właściwości i zastosowania różnych grup substancji chemicznych.	KN_Ch_W02 KN_Ch_W04	2 1
ChSiZCh_03	Potrafi analizować i oceniać wpływ substancji chemicznych na środowisko naturalne i zdrowie ludzi.	KN_Ch_W04	1
ChSiZCh_04	Ma świadomość zagrożeń związanych z obecnością i stosowaniem substancji chemicznych oraz potrafi podejmować działania mające na celu minimalizację tych zagrożeń.	KN_Ch_W06	1

ChSiZCh_05	Wykazuje umiejętność łączenia wiedzy z różnych gałęzi chemii i nauk pokrewnych oraz potrafi wytłumaczyć określone problemy z dziedziny biologii, ochrony środowiska i farmacji.	KN_Ch_K01 KN_Ch_U01 KN_Ch_W04	2 2 1
ChSiZCh_06	Ma wiedzę na temat obowiązujących przepisów, norm i standardów dotyczących bezpiecznego obchodzenia się z substancjami chemicznymi oraz potrafi je stosować w praktyce.	KN_Ch_W04 KN_Ch_W06	1 3
ChSiZCh_07	Dysponuje rozszerzoną wiedzą w zakresie chemii, zna aktualne trendy i najnowsze odkrycia i dostrzega jej znaczenie dla rozwoju ludzkości i poznania świata.	KN_Ch_K01 KN_Ch_W02	2 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*
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*
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
ChSiZCh_fs_01	practical classes	15	course work	ChSiZCh_01, ChSiZCh_02, ChSiZCh_03, ChSiZCh_04, ChSiZCh_05, ChSiZCh_06, ChSiZCh_07	b02, b05, 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?
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*	Yes

		developed during previous classes or new skills necessary for the implementation of subsequent 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
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*	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Assessment and diagnosis in secondary education**
Module code	W4-MT-S2-23-OiDwSPP
Number of the ECTS credits	2
Language of instruction	Polish
Purpose and description of the content of education	Moduł obejmuje treści dotyczące diagnostyki edukacyjnej jako narzędzia umożliwiającego rozpoznawanie jakości procesu kształcenia. Należą do nich między innymi: Ocenianie ucznia: ocenianie jako proces wspierania jego edukacyjnego rozwoju konstruowanie narzędzi przydatnych w procesie oceniania uczniów, ocenianie kształtujące a efektywność nauczania. Ewaluacja: ocena jakości pracy nauczyciela. ocena jakości pracy szkoły (placówki oświatowej) –wymierne i niewymierne efekty edukacyjne. ewaluacja edukacyjna. edukacyjna wartość dodana. autoewaluacja, projektowanie ścieżki własnego rozwoju (samokształcenie zawodowe, samodoskonalenie). Diagnoza wstępna grupy uczniowskiej i każdego ucznia.
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)
OiDwSP_01	Student zna i rozumie rolę diagnozy, kontroli i oceniania w pracy dydaktycznej; ocenianie i jego rodzaje: ocenianie bieżące, semestralne i roczne, ocenianie wewnętrzne i zewnętrzne; funkcje oceny.	KN.2023_U10 KN.2023_U11 KN.2023_W02 KN.2023_W07 KN.2023_W09	4 4 4 4 4
OiDwSP_02	Student zna i rozumie egzaminy kończące etap edukacyjny i sposoby konstruowania testów, sprawdzianów oraz innych narzędzi przydatnych w procesie oceniania uczniów w ramach nauczanego przedmiotu.	KN.2023_U10 KN.2023_U11 KN.2023_W02 KN.2023_W07	4 4 4 4
OiDwSP_03	Student zna i rozumie diagnozę wstępną grupy uczniowskiej i każdego ucznia w kontekście nauczanego przedmiotu lub prowadzonych zajęć oraz sposoby wspomagania rozwoju poznawczego uczniów.	KN.2023_U10 KN.2023_U11 KN.2023_W02	4 4 4

		KN.2023_W04 KN.2023_W07 KN.2023_W14	4 4 4
OiDwSP_04	Student potrafi merytorycznie, profesjonalnie i rzetelnie oceniać pracę uczniów wykonywaną w klasie i w domu.	KN.2023_U10 KN.2023_W02 KN.2023_W03 KN.2023_W04 KN.2023_W14	4 4 4 4 4
OiDwSP_05	Student potrafi skonstruować sprawdzian służący ocenie danych umiejętności uczniów.	KN.2023_U10 KN.2023_U11 KN.2023_W02 KN.2023_W03 KN.2023_W04 KN.2023_W14	4 4 4 4 4 4
OiDwSP_06	Student potrafi przeprowadzić wstępną diagnozę umiejętności ucznia.	KN.2023_U10 KN.2023_U11 KN.2023_W02 KN.2023_W03 KN.2023_W04 KN.2023_W14	4 4 4 4 4 4
OiDwSP_07	Student jest gotów do popularyzowania wiedzy wśród uczniów i w środowisku szkolnym oraz pozaszkolnym.	KN.2023_U06 KN.2023_U07 KN.2023_U14	2 2 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*
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*

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**
OiDwSP_01	discussion classes	30	course work	OiDwSP_01, OiDwSP_02, OiDwSP_03, OiDwSP_04, OiDwSP_05, OiDwSP_06, OiDwSP_07	b02, b04

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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Chemistry everyday life**
Module code	W4-MT-S2-23-ChWN
Number of the ECTS credits	2
Language of instruction	Polish
Purpose and description of the content of education	Celem modułu Chemia wokół nas jest przekazanie studentom wiedzy na temat otaczającej nas chemii i zachodzących wokół nas procesów chemicznych. Student poznaje aspekty związane z żywieniem, wpływem substancji chemicznych na jakość żywności, poznaje również skład chemiczny i działanie środków czystości, środków pielęgnacyjnych, kosmetyków i konserwantów. Student poznaje techniki recepturowania i przygotowywania formulacji różnego rodzaju preparatów chemicznych wykorzystywanych w życiu codziennym. Student nabiera umiejętności w zakresie prowadzenia doświadczeń i eksperymentów. Student nabiera umiejętności w zakresie opracowania receptur i formulacji różnego rodzaju preparatów. Student poznaje wpływ czynników zewnętrznych na funkcjonowanie i zdrowie człowieka. Student poznaje innowacje technologiczne związane z procesami chemicznymi w otaczającej przestrzeni.
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)
ChWN_01	Ma pogłębioną wiedzę w zakresie znajomości związków chemicznych stosowanych w gospodarstwie domowym.	KN_Ch_W01	4
ChWN_02	Zna substancje stosowane w kosmetykach i farmaceutykach.	KN_Ch_W02	4
ChWN_03	Zna zasady BHP i zasady zielonej chemii pozwalające na samodzielną pracę laboratoryjną.	KN_Ch_W06	4
ChWN_04	Zna wpływ konserwantów i substancji szkodliwych na organizm ludzki.	KN_Ch_W02	4
ChWN_05	Zna innowacyjne i nowoczesne substancje naturalne stosowane w kompozycjach kosmetycznych oraz dietetyce.	KN_Ch_W02	4
ChWN_06	Potrafi otrzymać podstawowe formulacje i opracować receptury kosmetyków i środków czystości.	KN_Ch_U01	4
ChWN_07	Potrafi zaplanować i przeprowadzić syntezy związków biologicznie aktywnych w oparciu o dobre praktyki laboratoryjne.	KN_Ch_U06	5
ChWN_08	Potrafi samodzielnie przeanalizować i ocenić krytycznie skład produktów stosowanych w życiu codziennym.	KN_Ch_U07	4
ChWN_09	Rozumie konieczność stosowania interdyscyplinarnego podejścia i łączenia wiedzy z różnych dziedzin w pracy związanej z poprawą jakości życia i zdrowia społeczeństw.	KN_Ch_K01	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*
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*

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**
ChWN_fs_01	workshop	15	course work	ChWN_01, ChWN_02, ChWN_03, ChWN_04, ChWN_05, ChWN_06, ChWN_07, ChWN_08, ChWN_09	b02, c07, 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?**
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
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*	Yes

		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

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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Chemistry in Exercise**
Module code	W4-MT-S2-23-ChwZ
Number of the ECTS credits	4
Language of instruction	Polish
Purpose and description of the content of education	Moduł ma na celu pogłębienie rozumienia treści programowych z zakresu chemii realizowanej w szkole ponadpodstawowej w stopniu umożliwiającym osiągnięcie biegłości w rozwiązywaniu zadań z chemii na poziomie rozszerzonym, zadań maturalnych oraz konkursowych. Realizowane treści umożliwią Studentom dobór odpowiednich metod pracy z uczniem i wybór rozwiązań metodycznych odpowiednich do potrzeb i możliwości ucznia.
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)
ChwZ_01	Zna i rozumie metodykę realizacji poszczególnych treści kształcenia z przedmiotu chemia - 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
ChwZ_02	Zna i potrafi rozpoznać typowe dla chemii błędy uczniowskie i sposoby zapobiegania im poprzez stosowanie odpowiednich metod pracy z uczniem.	KN.2023_U10 KN.2023_W02 KN.2023_W14	4 4 4
ChwZ_03	Zna i rozumie stosowane metody kształcenia w odniesieniu do nauczanego przedmiotu lub prowadzonych zajęć.	KN.2023_U02 KN.2023_U06 KN.2023_W02 KN.2023_W15	4 4 4 4
ChwZ_04	Potrafi identyfikować typowe zadania szkolne z celami kształcenia, w szczególności w odniesieniu do podstawy programowej	KN.2023_U02	3

		KN.2023_U04 KN.2023_W14	3 3
ChwZ_05	Jest gotów do motywowania uczniów do uczenia się przez całe życie przez samodzielną pracę.	KN.2023_KS04 KN.2023_U06 KN.2023_U10 KN.2023_W02 KN.2023_W03	3 4 4 4 4

9. Methods of conducting classes

Code	Category	Name (description)
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*
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*
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*

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
ChwZ_fs_01	practical classes	45	course work	ChwZ_01, ChwZ_02, ChwZ_03, ChwZ_04, ChwZ_05	b05, b09, d03, 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*	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
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

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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Complex Analysis**
Module code	W4-MT-S2-23-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_fs_1	lecture	30	exam	AZes_3, AZes_4, AZes_5, AZes_6	a01
AZes_fs_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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Computational Mathematics**
Module code	W4-MT-S2-23-MObl
Number of the ECTS credits	4
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 K_W05	1 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_fs_1	lecture	15	course work	MObl_1, MObl_2, MObl_3, MObl_4, MObl_5	a01, a05
MObl_fs_2	laboratory classes	30	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Computer networks**
Module code	W4-MT-S2-23-SKom
Number of the ECTS credits	6
Language of instruction	Polish
Purpose and description of the content of education	Moduł „Sieci komputerowe” ma na celu zaznajomienie z budową i działaniem lokalnych i rozległych sieci komputerowych. Ma nauczyć realizacji podstawowych usług sieciowych np. udostępniania plików w sieciach lokalnych i rozległych, konfiguracji podstawowych urządzeń sieciowych oraz diagnostyki sieci i usuwania usterek. 1.Sieci LAN, MAN i WAN. 2.Media transmisyjne w sieciach komputerowych (przewodowe i bezprzewodowe). 3.Protokoły sieciowe. 4.Warstwowe modele sieci komputerowej. 5.Protokół IPv4 i IPv6. 6.Adresy prywatne i publiczne. 7.Podział sieci na podsieci. 8.Urządzenia do łączenia sieci komputerowych. 9.Protokoły warstwy transportowej – TCP i UDP. 10.Podstawy systemu DNS. 11.System domen w Internecie. 12.Serwery DNS – funkcje i lokalizacja. 13.Udostępnianie plików w sieci lokalnej i rozległej. 14.Konfiguracja sieci VPN. 15.Bezpieczeństwo sieci komputerowych.
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)
SKom_1	Zna podstawowe pojęcia związane z sieciami komputerowymi	KN_NI_W03	4
SKom_2	Umie dobierać i konfigurować podstawowe urządzenia do obsługi sieci lokalnych	KN_NI_U02 KN_NI_W03	2 2

SKom_3	Zna podstawowe protokoły sieciowe	KN_NI_W03	3
SKom_4	Potrafi przeprowadzić diagnostykę sieci przewodowych i bezprzewodowych	KN_NI_U10	3
SKom_5	Potrafi skonfigurować podstawowe usługi sieciowe	KN_NI_U10	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*
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*

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
SKom_fs_1	lecture	15	course work	SKom_1, SKom_2, SKom_3	a03
SKom_fs_2	laboratory classes	45	course work	SKom_2, SKom_4, SKom_5	b08, c06, 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	Yes

		agreeing on materials complementary to those indicated in the syllabus, supporting the implementation 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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Continuous Didactic Practicium in Computer Science**
Module code	W4-MT-S2-23-PNCzI
Number of the ECTS credits	1
Language of instruction	Polish
Purpose and description of the content of education	W trakcie praktyki następuje kształtowanie kompetencji dydaktycznych przez: 1) pełnienie roli nauczyciela, w szczególności planowanie lekcji, formułowanie celów, dobór metod i form pracy oraz środków dydaktycznych, organizację i prowadzenie lekcji w oparciu o samodzielnie opracowywane scenariusze 2) poznanie realizowanych przez szkołę zadań dydaktycznych, sposobu jej funkcjonowania, organizacji pracy, pracowników, uczestników procesów pedagogicznych oraz prowadzonej dokumentacji; 3) obserwowanie: a) czynności podejmowanych przez opiekuna praktyk w toku prowadzonych przez niego lekcji, b) procesów komunikowania interpersonalnego i społecznego w klasie, ich prawidłowości i zakłóceń, c) sposobów aktywizowania i dyscyplinowania uczniów oraz różnicowania poziomu aktywności poszczególnych uczniów, d) sposobu oceniania uczniów, e) sposobów zadawania i sprawdzania pracy domowej, f) dynamiki i klimatu społecznego klasy, ról pełnionych przez uczniów, zachowania i postaw uczniów, 4) współdziałanie z opiekunem praktyk w celu: a) poszerzania swojej wiedzy dydaktycznej oraz rozwijania umiejętności wychowawczych b) pogłębienia umiejętności analizowania obserwowanych i doświadczanych w trakcie praktyk sytuacji i zdarzeń pedagogicznych.
List of modules that must be completed before starting this module (if necessary)	[W4-MT-S2-23-PITut1] Praktyka nauczycielska z informatyki, tutoring I

8. Learning outcomes of the module

Code	Description	Learning outcomes of the programme	Level of competenc (scale 1-5)
PNCzI_01	Student zna zadania dydaktyczne realizowane przez szkołę lub placówkę systemu oświaty.	KN.2023_U17 KN.2023_W01 KN.2023_W08 KN.2023_W09	1 4 4 4
PNCzI_02	Student zna sposób funkcjonowania oraz organizację pracy dydaktycznej szkoły lub placówki systemu oświaty.	KN.2023_W08 KN.2023_W11	4 4
PNCzI_03	Student zna rodzaje dokumentacji działalności dydaktycznej prowadzonej w szkole lub placówce systemu oświaty.	KN.2023_W08 KN.2023_W09	4 4

PNCzI_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 KN.2023_U02 KN.2023_U10 KN.2023_U12	4 4 4 4
PNCzI_05	Student potrafi zaplanować i przeprowadzić pod nadzorem opiekuna praktyk zawodowych serię lekcji lub zajęć.	KN.2023_U04 KN.2023_U05 KN.2023_U13	4 4 4
PNCzI_06	Student potrafi analizować sytuacje i zdarzenia pedagogiczne zaobserwowane lub doświadczone w czasie praktyk.	KN.2023_U01 KN.2023_U06 KN.2023_U07	4 4 4
PNCzI_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 KN.2023_KS03 KN.2023_KS07	4 4 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*

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
PNCzI_fs_01	internship	15	course work	PNCzI_01, PNCzI_02, PNCzI_03, PNCzI_04, PNCzI_05, PNCzI_06, PNCzI_07	e05

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
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*	No
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*	Yes

		and grades before submitting the portfolio for acceptance	

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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Continuous Didactic Practicium in Mathematics**
Module code	W4-MT-S2-23-PNCzM
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)	[W4-MT-S2-23-PNMat1] Education Practicium from Mathematics, Tutoring I

8. Learning outcomes of the module

Code	Description	Learning outcomes of the programme	Level of competenc (scale 1-5)
PNCzM_01	Student na i rozumie zadania dydaktyczne realizowane przez szkołę lub placówkę systemu oświaty.	KN.2023_W01 KN.2023_W08 KN.2023_W09	4 4 4
PNCzM_02	Student zna i rozumie sposób funkcjonowania oraz organizację pracy dydaktycznej szkoły lub placówki systemu oświaty.	KN.2023_W08 KN.2023_W11	4 4
PNCzM_03	Student zna rodzaje dokumentacji działalności dydaktycznej prowadzonej w szkole lub placówce systemu oświaty.	KN.2023_W08 KN.2023_W09	4 4
PNCzM_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 KN.2023_U02 KN.2023_U10 KN.2023_U12	4 4 4 4
PNCzM_05	Student potrafi zaplanować i przeprowadzić pod nadzorem opiekuna praktyk zawodowych serię lekcji lub zajęć.	KN.2023_U01 KN.2023_U02 KN.2023_U03 KN.2023_U06	4 4 4 4

		KN.2023_U07 KN.2023_U08 KN.2023_U09 KN.2023_U12	4 4 3 3
PNCzM_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 KN.2023_U01	4 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	PNCzM_01, PNCzM_02, PNCzM_03, PNCzM_04, PNCzM_05, PNCzM_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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Continuous Education Practicium from Chemistry**
Module code	W4-MT-S2-23-PNCzCh
Number of the ECTS credits	1
Language of instruction	Polish
Purpose and description of the content of education	W trakcie praktyki następuje kształtowanie kompetencji dydaktycznych przez: 1) pełnienie roli nauczyciela, w szczególności planowanie lekcji, formułowanie celów, dobór metod i form pracy oraz środków dydaktycznych, organizację i prowadzenie lekcji w oparciu o samodzielnie opracowywane scenariusze 2) poznanie realizowanych przez szkołę zadań dydaktycznych, sposobu jej funkcjonowania, organizacji pracy, pracowników, uczestników procesów pedagogicznych oraz prowadzonej dokumentacji; 3) obserwowanie: a) czynności podejmowanych przez opiekuna praktyk w toku prowadzonych przez niego lekcji, b) procesów komunikowania interpersonalnego i społecznego w klasie, ich prawidłowości i zakłóceń, c) sposobów aktywizowania i dyscyplinowania uczniów oraz różnicowania poziomu aktywności poszczególnych uczniów, d) sposobu oceniania uczniów, e) sposobów zadawania i sprawdzania pracy domowej, f) dynamiki i klimatu społecznego klasy, ról pełnionych przez uczniów, zachowania i postaw uczniów, 4) współdziałanie z opiekunem praktyk w celu: a) poszerzania swojej wiedzy dydaktycznej oraz rozwijania umiejętności wychowawczych b) pogłębienia umiejętności analizowania obserwowanych i doświadczanych w trakcie praktyk sytuacji i zdarzeń pedagogicznych.
List of modules that must be completed before starting this module (if necessary)	[W4-MT-S2-23-PNCh1] Education Practicium from Chemistry, Tutoring I

8. Learning outcomes of the module

Code	Description	Learning outcomes of the programme	Level of competenc (scale 1-5)
PNCzCh_01	Student zna zadania dydaktyczne realizowane przez szkołę lub placówkę systemu oświaty.	KN.2023_U17 KN.2023_W08 KN.2023_W09	1 4 4
PNCzCh_02	Student zna sposób funkcjonowania oraz organizację pracy dydaktycznej szkoły lub placówki systemu oświaty.	KN.2023_W08 KN.2023_W11	4 4
PNCzCh_03	Student zna rodzaje dokumentacji działalności dydaktycznej prowadzonej w szkole lub placówce systemu oświaty.	KN.2023_W08 KN.2023_W09	4 4
PNCzCh_04	Student potrafi wyciągnąć wnioski z obserwacji pracy dydaktycznej nauczyciela, jego interakcji z uczniami oraz sposobu	KN.2023_U01	4

	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_U02 KN.2023_U10 KN.2023_U12	4 4 4
PNCzCh_05	Student potrafi zaplanować i przeprowadzić pod nadzorem opiekuna praktyk zawodowych serię lekcji lub zajęć.	KN.2023_U04 KN.2023_U05 KN.2023_U13	4 4 4
PNCzCh_06	Student potrafi analizować sytuacje i zdarzenia pedagogiczne zaobserwowane lub doświadczone w czasie praktyk.	KN.2023_U01 KN.2023_U06 KN.2023_U07	4 4 4
PNCzCh_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 KN.2023_KS03 KN.2023_KS07	4 4 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*

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
PNCzCh_fs_01	internship	15	course work	PNCzCh_01, PNCzCh_02, PNCzCh_03, PNCzCh_04, PNCzCh_05, PNCzCh_06, PNCzCh_07	e05

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
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*	No
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*	Yes

		order to obtain credit for such classes; verification of the description, necessary attachments, opinions and grades before submitting the portfolio for acceptance	

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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Coordination Compounds**
Module code	W4-MT-S2-23-ChZK
Number of the ECTS credits	2
Language of instruction	Polish
Purpose and description of the content of education	Moduł Chemii związków koordynacyjnych zapoznaje Studenta z rodzajami i nazewnictwem ligandów i związków koordynacyjnych. Student zapoznaje się z metodami otrzymywania, właściwościami fizykochemicznymi, budową i izomerią związków koordynacyjnych. Potrafi zaplanować i przeprowadzić eksperyment ściśle związany z omawianymi zagadnieniami.
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)
ChZK_01	Zna zasady nomenklatury ligandów i związków koordynacyjnych.	KN_Ch_W01 KN_Ch_W02	5 4
ChZK_02	Zna metody otrzymywania, właściwości, reaktywność i budowę związków koordynacyjnych.	KN_Ch_K01 KN_Ch_U03 KN_Ch_U04 KN_Ch_W01	4 5 5 5
ChZK_03	Opracowuje raporty i sprawozdania z zakresu syntezy związków koordynacyjnych.	KN_Ch_U03 KN_Ch_U05 KN_Ch_U06	5 5 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*

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
ChZK_fs_01	workshop	15	course work	ChZK_01, ChZK_02, ChZK_03	b02, e01

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

Code	Category	Name (description)	Is it part of the BUNA?
a02	Preparation for classes	Literature reading / analysis of source materials *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
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*	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Database systems**
Module code	W4-MT-S2-23-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.	KN_NI_U09 KN_NI_W08	4 5
BDan_2	Umiejętność projektowania i zarządzania bazami danych	KN_NI_U09	5

	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.	KN_NI_W08	4
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	KN_NI_U05 KN_NI_U09 KN_NI_W08	2 3 4
BDan_4	Umiejętność współpracy w grupie oraz organizowania pracy grupy podczas realizacji wspólnych projektów informatycznych Umiejętność zespołowego tworzenia projektu bazodanowego	KN_NI_U11	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*
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_fs_1	lecture	15	course work	BDan_1, BDan_2	a01
BDan_fs_2	laboratory classes	45	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)*	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

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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Didactics of Chemistry**
Module code	W4-MT-S2-23-DCh
Number of the ECTS credits	2
Language of instruction	Polish
Purpose and description of the content of education	Celem przedmiotu jest dalsze zintegrowanie dla potrzeb studenta wiedzy z różnych dyscyplin (jak dydaktyka ogólna, psychologia, pedagogika, a przede wszystkim - chemia) tak, aby ułatwić mu zrozumienie tego procesu w stopniu umożliwiającym samodzielne jego kreowanie jako nauczyciela na trzecim etapie edukacyjnym (szkoły ponadpodstawowe). Dydaktyka chemii obejmuje kolejną 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)
DCh_01	Student zna i rozumie podstawę programową danego przedmiotu, cele kształcenia i treści nauczania przedmiotu lub prowadzonych zajęć na poszczególnych etapach edukacyjnych, przedmiot lub rodzaj zajęć w kontekście wcześniejszego i dalszego kształcenia, strukturę wiedzy w zakresie przedmiotu nauczania lub prowadzonych zajęć oraz kompetencje kluczowe i ich kształtowanie w ramach nauczania przedmiotu lub prowadzenia zajęć	KN.2023_U02 KN.2023_W08 KN.2023_W09	3 3 3
DCh_02	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_W03	4
DCh_03	Student zna i rozumie organizację pracy w klasie szkolnej i grupach: potrzebę indywidualizacji nauczania, zagadnienie nauczania interdyscyplinarnego, formy pracy specyficzne dla nauczanego przedmiotu: wycieczki, zajęcia terenowe, doświadczenia i konkursy oraz zagadnienia związane z pracą domową.	KN.2023_W11	4
DCh_04	Student zna i rozumie egzaminy kończące etap edukacyjny i sposoby konstruowania testów, sprawdzianów oraz innych narzędzi przydatnych w procesie oceniania uczniów w ramach nauczanego przedmiotu.	KN.2023_W07	4

DCh_05	Student zna i rozumie diagnozę wstępną grupy uczniowskiej i każdego ucznia w kontekście nauczanego przedmiotu oraz sposoby wspomagania rozwoju poznawczego uczniów; potrzebę kształtowania pojęć, postaw, umiejętności praktycznych, w tym rozwiązywania problemów, i wykorzystywania wiedzy; metody i techniki skutecznego uczenia się; metody strukturyzacji wiedzy oraz konieczność powtarzania i utrwalania wiedzy i umiejętności.	KN.2023_W07	4
DCh_06	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_W02	4
DCh_07	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_W03	3
DCh_08	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_W05	4
DCh_09	Student potrafi identyfikować typowe zadania szkolne z celami kształcenia, w szczególności z wymaganiami ogólnymi podstawy programowej, oraz z kompetencjami kluczowymi.	KN.2023_U02 KN.2023_U07	3 3
DCh_10	Student potrafi identyfikować powiązania treści nauczanego przedmiotu z innymi treściami nauczania.	KN.2023_U02 KN.2023_U03 KN.2023_U07	4 2 4
DCh_11	Student potrafi dostosować sposób komunikacji do poziomu rozwojowego uczniów.	KN.2023_U15	4
DCh_12	Student potrafi kreować sytuacje dydaktyczne służące aktywności i rozwojowi zainteresowań uczniów oraz popularyzacji wiedzy.	KN.2023_U07	5
DCh_13	Student potrafi podejmować skuteczną współpracę w procesie dydaktycznym z rodzicami lub opiekunami uczniów, pracownikami szkoły i środowiskiem pozaszkolnym.	KN.2023_U05	5
DCh_14	Student potrafi skonstruować sprawdzian, służący ocenie danych umiejętności uczniów.	KN.2023_U10	5
DCh_15	Student potrafi rozpoznać typowe dla nauczanego przedmiotu błędy uczniowskie i wykorzystać je w procesie dydaktycznym.	KN.2023_U03	5
DCh_16	Student potrafi przeprowadzić wstępną diagnozę umiejętności ucznia.	KN.2023_U10	4
DCh_17	Student jest gotów do adaptowania metod pracy do potrzeb i różnych stylów uczenia się uczniów.	KN.2023_KS04	4
DCh_18	Student jest gotów do popularyzowania wiedzy wśród uczniów i w środowisku szkolnym oraz pozaszkolnym.	KN.2023_KS02	3
DCh_19	Student jest gotów do zachęcania uczniów do podejmowania prób badawczych.	KN.2023_KS04	3
DCh_20	Student jest gotów do kształtowania umiejętności współpracy uczniów, w tym grupowego rozwiązywania problemów.	KN.2023_KS07	4
DCh_21	Student jest gotów do rozwijania u uczniów ciekawości, aktywności i samodzielności poznawczej oraz logicznego i krytycznego myślenia.	KN.2023_KS04	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*
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*
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*
e02	Practical methods	Production exercise – workshop *an activity involving the creation of an object/product according to the rules/principles/description provided by the academic teacher acting as the workshop master*
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**
DCh_fs_01	workshop	30	course work	DCh_01, DCh_02, DCh_03, DCh_04, DCh_05, DCh_06, DCh_07, DCh_08, DCh_09, DCh_10, DCh_11, DCh_12, DCh_13, DCh_14, DCh_15, DCh_16, DCh_17, DCh_18, DCh_19, DCh_20, DCh_21	b04, b08, c07, d03, e01, e02, 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
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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Didactics of Computer Science**
Module code	W4-MT-S2-23-DInf
Number of the ECTS credits	2
Language of instruction	Polish
Purpose and description of the content of education	Celem przedmiotu jest dalsze zintegrowanie dla potrzeb studenta wiedzy z różnych dyscyplin (jak dydaktyka ogólna, psychologia, pedagogika, a przede wszystkim - informatyka) tak, aby ułatwić mu zrozumienie tego procesu w stopniu umożliwiającym samodzielne jego kreowanie jako nauczyciela na trzecim etapie edukacyjnym (szkoły ponadpodstawowe). Dydaktyka informatyki obejmuje kolejną 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)
DInf _01	Student zna i rozumie podstawę programową danego przedmiotu, cele kształcenia i treści nauczania przedmiotu lub prowadzonych zajęć na poszczególnych etapach edukacyjnych, przedmiot lub rodzaj zajęć w kontekście wcześniejszego i dalszego kształcenia, strukturę wiedzy w zakresie przedmiotu nauczania lub prowadzonych zajęć oraz kompetencje kluczowe i ich kształtowanie w ramach nauczania przedmiotu lub prowadzenia zajęć	KN.2023_U02 KN.2023_W08 KN.2023_W09	3 3 3
DInf _03	Student zna i rozumie organizację pracy w klasie szkolnej i grupach: potrzebę indywidualizacji nauczania, zagadnienie nauczania interdyscyplinarnego, formy pracy specyficzne dla nauczanego przedmiotu: wycieczki, zajęcia terenowe, doświadczenia i konkursy oraz zagadnienia związane z pracą domową.	KN.2023_W11	4
DInf _04	Student zna i rozumie egzaminy kończące etap edukacyjny i sposoby konstruowania testów, sprawdzianów oraz innych narzędzi przydatnych w procesie oceniania uczniów w ramach nauczanego przedmiotu.	KN.2023_W07	4
DInf _05	Student zna i rozumie diagnozę wstępną grupy uczniowskiej i każdego ucznia w kontekście nauczanego przedmiotu oraz sposoby wspomagania rozwoju poznawczego uczniów; potrzebę kształtowania pojęć, postaw, umiejętności praktycznych, w tym rozwiązywania problemów, i wykorzystywania wiedzy; metody i techniki skutecznego uczenia się; metody strukturyzacji wiedzy oraz konieczność powtarzania i utrwalania wiedzy i umiejętności.	KN.2023_W07	4
DInf _06	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	KN.2023_W02	4

	kulturalnych.		
DInf _07	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_W03	3
DInf _08	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_W05	4
DInf _09	Student potrafi identyfikować typowe zadania szkolne z celami kształcenia, w szczególności z wymaganiami ogólnymi podstawy programowej, oraz z kompetencjami kluczowymi.	KN.2023_U02 KN.2023_U07	3 3
DInf _10	Student potrafi identyfikować powiązania treści nauczanego przedmiotu z innymi treściami nauczania.	KN.2023_U02 KN.2023_U03 KN.2023_U07	4 2 4
DInf _11	Student potrafi dostosować sposób komunikacji do poziomu rozwojowego uczniów.	KN.2023_U15	4
DInf _12	Student potrafi kreować sytuacje dydaktyczne służące aktywności i rozwojowi zainteresowań uczniów oraz popularyzacji wiedzy.	KN.2023_U07	5
DInf _13	Student potrafi podejmować skuteczną współpracę w procesie dydaktycznym z rodzicami lub opiekunami uczniów, pracownikami szkoły i środowiskiem pozaszkolnym.	KN.2023_U05	5
DInf _14	Student potrafi skonstruować sprawdzian, służący ocenie danych umiejętności uczniów.	KN.2023_U10	5
DInf _15	Student potrafi rozpoznać typowe dla nauczanego przedmiotu błędy uczniowskie i wykorzystać je w procesie dydaktycznym.	KN.2023_U03	5
DInf _16	Student potrafi przeprowadzić wstępną diagnozę umiejętności ucznia.	KN.2023_U10	4
DInf _17	Student jest gotów do adaptowania metod pracy do potrzeb i różnych stylów uczenia się uczniów.	KN.2023_KS04	4
DInf _18	Student jest gotów do popularyzowania wiedzy wśród uczniów i w środowisku szkolnym oraz pozaszkolnym.	KN.2023_KS02	3
DInf _19	Student jest gotów do zachęcania uczniów do podejmowania prób badawczych.	KN.2023_KS04	3
DInf _20	Student jest gotów do kształtowania umiejętności współpracy uczniów, w tym grupowego rozwiązywania problemów.	KN.2023_KS07	4
DInf _21	Student jest gotów do rozwijania u uczniów ciekawości, aktywności i samodzielności poznawczej oraz logicznego i krytycznego myślenia.	KN.2023_KS04	3
DInf_02	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_W03	4
DInf_22	Student posiada wiedzę dotyczącą zagadnień prawnych i etycznych związanych z informatyką.	KN_NI_W11	4

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*
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*
e02	Practical methods	Production exercise – workshop *an activity involving the creation of an object/product according to the rules/principles/description provided by the academic teacher acting as the workshop master*
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**
DInf_fs_01	workshop	30	course work	DInf _01, DInf _03, DInf _04, DInf _05, DInf _06, DInf _07, DInf _08, DInf _09, DInf _10, DInf _11, DInf _12, DInf _13, DInf _14, DInf _15, DInf _16, DInf _17, DInf _18, DInf _19, DInf _20, DInf _21, DInf_02, DInf_22	b04, b08, c07, d03, e02, 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
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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Didactics of Mathematics I**
Module code	W4-MT-S2-23-DMat1
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 w szkołach ponadpodstawowych (np. liceum, technikum).
List of modules that must be completed before starting this module (if necessary)	[W4-MT-S2-23-PDyd2] Fundamentals of Didactics II

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 KN.2023_U05 KN.2023_W07	3 3 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 KN.2023_U09 KN.2023_U13 KN.2023_W01 KN.2023_W06 KN.2023_W12	4 3 4 4 3 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_KS06 KN.2023_U11 KN.2023_W02 KN.2023_W04	3 3 3 3

		KN.2023_W05	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 KN.2023_W03 KN.2023_W07	3 3 3 3 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 KN.2023_U03	3 3

		KN.2023_U12 KN.2023_U15 KN.2023_W06 KN.2023_W15	3 3 3 3
DMat1_12	Student jest gotów do adaptowania metod pracy do potrzeb i różnych stylów uczenia się uczniów.	KN.2023_KS02 KN.2023_U01 KN.2023_W01	2 2 2
DMat1_13	Student jest gotów do zachęcania uczniów do podejmowania prób badawczych oraz systematycznej aktywności fizyczne.	KN.2023_U14 KN.2023_W11	2 2
DMat1_14	Student jest gotów do rozwijania u uczniów ciekawości, aktywności i samodzielności poznawczej oraz logicznego i krytycznego myślenia.	KN.2023_U06 KN.2023_U07 KN.2023_U08	2 2 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	No

		reading the literature indicated in the syllabus; reviewing, organizing, analyzing and selecting source materials to be used in class	
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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Didactics of Mathematics II**
Module code	W4-MT-S2-23-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.
List of modules that must be completed before starting this module (if necessary)	[W4-MT-S2-23-DMat1] Didactics of Mathematics I

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

	narzędzi przydatnych w procesie oceniania uczniów w ramach nauczanego przedmiotu.	KN.2023_U12 KN.2023_W03 KN.2023_W07	4 4 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 KN.2023_U01 KN.2023_U13 KN.2023_W03 KN.2023_W05	3 3 3 3 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 KN.2023_KS06 KN.2023_U02 KN.2023_U05 KN.2023_W02	3 3 3 3 3
DMat2_06	Student potrafi dostosować sposób komunikacji do poziomu rozwojowego uczniów.	KN.2023_KS03 KN.2023_U03 KN.2023_U12 KN.2023_U15 KN.2023_W12	3 3 3 3 3
DMat2_07	Student potrafi kreować sytuacje dydaktyczne służące aktywności i rozwojowi zainteresowań uczniów oraz popularyzacji wiedzy.	KN.2023_U06 KN.2023_U07 KN.2023_U14	3 3 3
DMat2_08	Student potrafi podejmować skuteczną współpracę w procesie dydaktycznym z rodzicami lub opiekunami uczniów, pracownikami szkoły i środowiskiem pozaszkolnym.	KN.2023_KS07 KN.2023_U05 KN.2023_U14 KN.2023_W03 KN.2023_W12	3 3 3 3 3
DMat2_09	Student potrafi rozpoznać typowe dla nauczanego przedmiotu lub prowadzonych zajęć błędy uczniowskie i wykorzystać je w procesie dydaktycznym.	KN.2023_U01 KN.2023_U06 KN.2023_U08 KN.2023_W14	2 2 2 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 KN.2023_KS02 KN.2023_W01	2 2 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 KN.2023_KS06 KN.2023_U01 KN.2023_W12	2 2 2 2
DMat2_12	Student jest gotów do kształtowania umiejętności współpracy uczniów, w tym grupowego rozwiązywania problemów.	KN.2023_KS01 KN.2023_U01 KN.2023_U02 KN.2023_W04 KN.2023_W15	2 2 2 2 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 KN.2023_U02 KN.2023_W10	2 2 2
DMat2_14	Student jest gotów do stymulowania uczniów do uczenia się przez całe życie przez samodzielną pracę.	KN.2023_KS06 KN.2023_W02	2 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*	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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Differential Equations**
Module code	W4-MT-S2-23-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_U06	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_fs_1	lecture	30	exam	RRoz_1, RRoz_2, RRoz_3, RRoz_5, RRoz_7, RRoz_8	a01
RRoz_fs_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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Education**
Module code	W4-MT-S2-23-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-2_1	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-2_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-2_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
PED-2_12	absolwent potrafi zaprojektować ścieżkę własnego rozwoju zawodowego; (B.2.U2)	KN.2023_U18	3

PED-2_13	absolwent zna i rozumie zasady projektowania ścieżki własnego rozwoju zawodowego; (B.2.W2)	KN.2023_W08 KN.2023_W09	2 2
PED-2_2	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-2_3	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-2_4	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, 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_W03 KN.2023_W09 KN.2023_W12	4 4 4
PED-2_5	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-2_6	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-2_7	absolwent potrafi rozpoznawać sytuację zagrożeń i uzależnień uczniów; (B.2.U5.)	KN.2023_U01 KN.2023_U05	3 3
PED-2_8	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-2_9	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

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-2_fs_1	lecture	15	course work	PED-2_1, PED-2_10, PED-2_11, PED-2_13, PED-2_2, PED-2_3, PED-2_4, PED-2_5, PED-2_6, PED-2_7, PED-2_8, PED-2_9	a01, a03, c07
PED-2_fs_2	discussion classes	15	course work	PED-2_1, PED-2_10, PED-2_11, PED-2_12, PED-2_2, PED-2_3, PED-2_4, PED-2_5, PED-2_6, PED-2_7, PED-2_8, PED-2_9	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	Yes

		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.*	
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Education Practicium from Chemistry, Tutoring I**
Module code	W4-MT-S2-23-PNCh1
Number of the ECTS credits	2
Language of instruction	Polish
Purpose and description of the content of education	Celem praktyki nauczycielskiej w szkole jest gromadzenie doświadczeń związanych z pracą dydaktyczno – wychowawczą nauczyciela na III etapie edukacyjnym (szkoły ponadpodstawowe) i konfrontowanie nabytej wiedzy z zakresu chemii, dydaktyki ogólnej i dydaktyki chemii z rzeczywistością pedagogiczną w działaniu praktycznym. Praktyka dydaktyczna pozwala studentowi na opanowanie wiedzy i umiejętności z zakresu: 1. zadań dydaktycznych realizowanych przez szkołę; 2. sposobów funkcjonowania oraz organizacji pracy dydaktycznej szkoły; 3. rodzajów dokumentacji działalności dydaktycznej prowadzonej w szkole; 4. wyciągania wniosków z obserwacji pracy dydaktycznej nauczyciela, jego interakcji z uczniami oraz sposobu planowania i przeprowadzania zajęć dydaktycznych; 5. aktywnego obserwowania stosowanych przez nauczyciela metod i form pracy oraz wykorzystywania pomocy dydaktycznych, a także sposobów oceniania uczniów oraz zadawania i sprawdzania pracy domowej; 6. zaplanowania i przeprowadzenia pod nadzorem opiekuna praktyk zawodowych serii lekcji oraz omawianie zgromadzonych doświadczeń w grupie studentów (słuchaczy); 7. skutecznego współdziałania z opiekunem praktyk zawodowych i nauczycielami w celu poszerzania swojej wiedzy dydaktycznej oraz rozwijania umiejętności wychowawczych. W module tym przewiduje się również personalizację procesu kształcenia przyszłego nauczyciela chemii budowaną w oparciu o indywidualną opiekę nad studentem (tutoring): - diagnozowanie mocnych i słabych stron studenta jako przyszłego nauczyciela; - wspomaganie studentów w planowaniu i realizacji zadań o charakterze samorozwojowym; - indywidualne doradztwo metodyczne.
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)
PNCh1_01	Student zna zadania dydaktyczne realizowane przez szkołę lub placówkę systemu oświaty.		

		KN.2023_W08 KN.2023_W09	3 3
PNCh1_02	Student zna sposób funkcjonowania oraz organizację pracy dydaktycznej szkoły lub placówki systemu oświaty.	KN.2023_W08 KN.2023_W09 KN.2023_W11	3 3 3
PNCh1_03	Student zna rodzaje dokumentacji działalności dydaktycznej prowadzonej w szkole lub placówce systemu oświaty.	KN.2023_U04 KN.2023_W08 KN.2023_W09	3 3 3
PNCh1_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 KN.2023_U02 KN.2023_U08 KN.2023_U09 KN.2023_U10 KN.2023_W02 KN.2023_W04 KN.2023_W12 KN.2023_W15	3 3 2 3 2 3 2 3 3
PNCh1_05	Student potrafi zaplanować i przeprowadzić pod nadzorem opiekuna praktyk zawodowych serię lekcji lub zajęć.	KN.2023_U02 KN.2023_U03 KN.2023_U15 KN.2023_W02 KN.2023_W04 KN.2023_W14	3 3 3 3 3 3
PNCh1_06	Student potrafi analizować sytuacje i zdarzenia pedagogiczne zaobserwowane lub doświadczone w czasie praktyk.	KN.2023_U01 KN.2023_U02 KN.2023_U03 KN.2023_U04 KN.2023_W02 KN.2023_W04 KN.2023_W15	3 3 3 3 3 3 3
PNCh1_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 KN.2023_KS03 KN.2023_KS05 KN.2023_KS07	3 3 3 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*
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*

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**
PNCh1_fs_01	workshop	30	course work	PNCh1_01, PNCh1_02, PNCh1_03, PNCh1_04, PNCh1_05, PNCh1_06, PNCh1_07	e05
PNCh1_fs_02	tutoring	1	course work	PNCh1_04, PNCh1_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?**
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
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*	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*	No

		laboratory, in the open air, etc.; also self-education	

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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Education Practicium from Chemistry, Tutoring II**
Module code	W4-MT-S2-23-PNCh2
Number of the ECTS credits	2
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 chemii, dydaktyki ogólnej i dydaktyki chemii 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 chemii oraz analizować obserwowane i doświadczane zdarzenia pedagogiczne. Przygotowuje się też do współdziałania z nauczycielami celem poszerzania wiedzy i rozwijania umiejętności wychowawczych. W module tym przewiduje się również personalizację procesu kształcenia przyszłego nauczyciela chemii budowaną w oparciu o indywidualną opiekę nad studentem (tutoring): - diagnozowanie mocnych i słabych stron studenta jako przyszłego nauczyciela; - wspomaganie studentów w planowaniu i realizacji zadań o charakterze samorozwojowym; - indywidualne doradztwo metodyczne, wspieranie rozwoju kompetencji studenta, - budowanie profesjonalnego osądu w oparciu o analizy indywidualnych przypadków.
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)
PNCh2_01	Student zna zadania dydaktyczne realizowane przez szkołę lub placówkę systemu oświaty.	KN.2023_W08 KN.2023_W09	4 4
PNCh2_02	Student zna sposób funkcjonowania oraz organizację pracy dydaktycznej szkoły lub placówki systemu oświaty.	KN.2023_W08 KN.2023_W09	4 4

		KN.2023_W11	4
PNCh2_03	Student zna rodzaje dokumentacji działalności dydaktycznej prowadzonej w szkole lub placówce systemu oświaty.	KN.2023_U04 KN.2023_W08 KN.2023_W09	4 4 4
PNCh2_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 KN.2023_U02 KN.2023_U08 KN.2023_U09 KN.2023_U10 KN.2023_W02 KN.2023_W04 KN.2023_W12 KN.2023_W15	4 4 3 4 3 4 4 4 4
PNCh2_05	Student potrafi zaplanować i przeprowadzić pod nadzorem opiekuna praktyk zawodowych serię lekcji lub zajęć.	KN.2023_U02 KN.2023_U03 KN.2023_U15 KN.2023_W02 KN.2023_W04 KN.2023_W14	4 4 4 4 4 4
PNCh2_06	Student potrafi analizować sytuacje i zdarzenia pedagogiczne zaobserwowane lub doświadczone w czasie praktyk.	KN.2023_U01 KN.2023_U02 KN.2023_U03 KN.2023_U04 KN.2023_W02 KN.2023_W04 KN.2023_W15	4 4 4 4 4 4 4
PNCh2_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 KN.2023_KS03 KN.2023_KS05 KN.2023_KS07	4 4 4 4

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
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*

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
PNCh2_fs_01	workshop	30	course work	PNCh2_01, PNCh2_02, PNCh2_03, PNCh2_04, PNCh2_05, PNCh2_06, PNCh2_07	e05
PNCh2_fs_02	tutoring	1	course work	PNCh2_01, PNCh2_02, PNCh2_03, PNCh2_04	b04

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
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*	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Education Practicium from Computer Science, Tutoring II**
Module code	W4-MT-S2-23-PITut2
Number of the ECTS credits	2
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 informatyki, dydaktyki ogólnej i dydaktyki informatyki 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 chemii oraz analizować obserwowane i doświadczane zdarzenia pedagogiczne. Przygotowuje się też do współdziałania z nauczycielami celem poszerzania wiedzy i rozwijania umiejętności wychowawczych. W module tym przewiduje się również personalizację procesu kształcenia przyszłego nauczyciela informatyki budowaną w oparciu o indywidualną opiekę nad studentem (tutoring): - diagnozowanie mocnych i słabych stron studenta jako przyszłego nauczyciela; - wspomaganie studentów w planowaniu i realizacji zadań o charakterze samorozwojowym; - indywidualne doradztwo metodyczne, wspieranie rozwoju kompetencji studenta, - budowanie profesjonalnego osądu w oparciu o analizy indywidualnych przypadków.
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)
PITut2_1	student zna zadania dydaktyczne realizowane przez szkołę lub placówkę systemu oświaty	KN.2023_W08 KN.2023_W09	4 4
PITut2_2	student zna sposób funkcjonowania oraz organizację pracy dydaktycznej szkoły lub placówki systemu oświaty	KN.2023_W08 KN.2023_W09	4 4

		KN.2023_W11	4
PITut2_3	student zna rodzaje dokumentacji działalności dydaktycznej prowadzonej w szkole lub placówce systemu oświaty	KN.2023_U04 KN.2023_W08 KN.2023_W09	4 4 4
PITut2_4	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 KN.2023_U02 KN.2023_U08 KN.2023_U09 KN.2023_U10 KN.2023_W02 KN.2023_W04 KN.2023_W12 KN.2023_W15	4 4 3 4 3 4 4 4 4
PITut2_5	student potrafi zaplanować i przeprowadzić pod nadzorem opiekuna praktyk zawodowych serię lekcji lub zajęć	KN.2023_U02 KN.2023_U03 KN.2023_U15 KN.2023_W02 KN.2023_W04 KN.2023_W14	4 4 4 4 4 4
PITut2_6	student potrafi analizować sytuacje i zdarzenia pedagogiczne zaobserwowane lub doświadczone w czasie praktyk	KN.2023_U01 KN.2023_U02 KN.2023_U03 KN.2023_U04 KN.2023_W02 KN.2023_W04 KN.2023_W15	4 4 4 4 4 4 4
PITut2_7	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 KN.2023_KS03 KN.2023_KS05 KN.2023_KS07	4 4 4 4

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
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*

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
PITut2_fs_01	workshop	30	course work	PITut2_1, PITut2_2, PITut2_3, PITut2_4, PITut2_5, PITut2_6, PITut2_7	e05
PITut2_fs_02	tutoring	1	course work	PITut2_4, PITut2_6	b04

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
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
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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Education Practicium from Mathematics, Tutoring I**
Module code	W4-MT-S2-23-PNMat1
Number of the ECTS credits	3
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. W module tym przewiduje się również personalizację procesu kształcenia przyszłego nauczyciela informatyki budowaną w oparciu o indywidualną opiekę nad studentem (tutoring): - diagnozowanie mocnych i słabych stron studenta jako przyszłego nauczyciela; - wspomaganie studentów w planowaniu i realizacji zadań o charakterze samorozwojowym; - indywidualne doradztwo metodyczne.
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	3 3 3

		KN.2023_W09	3
		KN.2023_W11	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.*
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	60	course work	PNMat1_01, PNMat1_02, PNMat1_03, PNMat1_04, PNMat1_05, PNMat1_06, PNMat1_07	d02, f02
PNMat1_02	tutoring	2	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Education Practicium from Mathematics, Tutoring II**
Module code	W4-MT-S2-23-PNMat2
Number of the ECTS credits	3
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. W module tym przewiduje się również personalizację procesu kształcenia przyszłego nauczyciela informatyki budowaną w oparciu o indywidualną opiekę nad studentem (tutoring): - diagnozowanie mocnych i słabych stron studenta jako przyszłego nauczyciela; - wspomaganie studentów w planowaniu i realizacji zadań o charakterze samorozwojowym; - indywidualne doradztwo metodyczne.
List of modules that must be completed before starting this module (if necessary)	[W4-MT-S2-23-PNMat1] Education Practicium from Mathematics, Tutoring I

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	3 3 3

		KN.2023_W09	3
		KN.2023_W11	3
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_7	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	60	course work	PNMat2_01, PNMat2_02, PNMat2_03, PNMat2_04, PNMat2_05, PNMat2_7	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Elements of artificial intelligence**
Module code	W4-MT-S2-24-ESInt
Number of the ECTS credits	2
Language of instruction	Polish
Purpose and description of the content of education	The main goal of the module is to develop analytical skills (e.g. building mathematical models of selected problems from applied fields). Indirect goals include developing methodological skills (e.g. using available technology to prepare a project or analysis), developing cognitive skills (e.g. analysis of data/source content provided in the form of articles and textbooks, also in foreign languages), developing skills in interpreting and presenting the obtained results and developing teamwork skills (e.g. working in small groups during and outside workshops)
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	Knows and understands the latest discoveries and directions of development of mathematical theories.	K_K01 K_K02 K_W04 K_W05	5 1 2 2
WPMSKom_2	Is able to construct mathematical models used in specific applications of mathematics.	K_K01 K_K02 K_K04 K_U07 K_W04 K_W05	5 1 1 5 2 2
WPMSKom_3	Is able to carry out a computer simulation using a selected program.	K_K04 K_U07 K_U09	1 5 5

WPMSKom_4	Knows advanced computational techniques supporting the work of a mathematician and understands their limitations.	K_U07	4
WPMSKom_5	Knows the methods used to approximately solve problems.	K_K05 K_U07 K_W04	2 5 2
WPMSKom_6	Is ready to draw conclusions to deepen understanding of a given topic.	K_K01 K_K02 K_K05	5 3 2
WPMSKom_7	Is able to make a presentation of the results.	K_U09	5

9. Methods of conducting classes

Code	Category	Name (description)
b02	Problem-solving methods	Lecture-discussion *transmission of content involving interaction with the lecture audience; discussion of lecture-related issues is one of its elements or constitutes its follow-up*
b07	Problem-solving methods	Activating methods: a case study *a comprehensive description of a phenomenon connected with the selected discipline; reflecting the reality, presenting the 'what', 'where' and 'how' of the phenomenon, i.e., all of its key aspects to be discussed in class; used as a reproduction, presentation, discussion or diagnosis of factors that shape the phenomenon or interact with it; an in-depth qualitative analysis and evaluation of a selected phenomenon*
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*
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**
WPMSKom_fs_1	laboratory classes	30	course work	WPMSKom_1, WPMSKom_2, WPMSKom_3, WPMSKom_4, WPMSKom_5, WPMSKom_6, WPMSKom_7	b02, b07, c06, 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?**
a03	Preparation for classes	Developing practical skills *activities involving the repetition, refinement and consolidation of practical skills, including those developed during previous classes or new skills necessary for the implementation of subsequent elements of the curriculum (as preparation for class participation)*	Yes
a04	Preparation for classes	Consulting materials complementary to those indicated in the syllabus *agreeing on materials complementary to those indicated in the syllabus, supporting the implementation of tasks resulting from or necessary for class participation*	Yes
b01	Consulting the curriculum and the organization of classes	Getting acquainted with the syllabus content *reading through the syllabus and getting acquainted with its content*	No
b02	Consulting the curriculum and the organization of classes	Verification / adjustment / discussion of syllabus provisions *consulting the content of the syllabus, possibly in the presence of the year tutor or members of the class group, and, if necessary, reassessing the provisions concerning special conditions for class participation, e.g., space and time requirements, technical and other requirements, including conditions for participation in classes outside the walls of the university, classes organized in blocks, organized online, etc.*	No
b03	Consulting the curriculum and the organization of classes	Consulting the schedule *getting acquainted with the class schedule, possibly in the presence of the year tutor, in order to 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.*	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 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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Elements of Cryptography**
Module code	W4-MT-S2-23-WKry
Number of the ECTS credits	3
Language of instruction	Polish
Purpose and description of the content of education	Celem przedmiotu jest przedstawienie podstaw kryptografii oraz głównych problemów dotyczących zagadnień kryptograficznych wraz z algorytmami stosowanymi w rozwiązaniach. W szczególności omówione zostaną: podstawowe pojęcia kryptografii i kryptoanalizy, podstawy teoretyczne kryptografii, teoria informacji, teoria złożoności obliczeniowej, teoria liczb, algorytmy klasyczne, algorytmy symetryczne, algorytmy asymetryczne, zadania autoryzacji, weryfikacji, czy generowania podpisów cyfrowych, funkcje skrótu.
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)
EKry_01	Student zna podstawowe grupy systemów kryptograficznych.	KN_NI_W10 K_W05	5 2
EKry_02	Student potrafi szyfrować i deszyfrować w określonym systemie kryptograficznym.	K_K02 KN_NI_W10	1 1
EKry_03	Student stosuje podstawowe zasady zabezpieczenia danych.	KN_NI_W10	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
EKry_fs_01	lecture	15	course work	EKry_01, EKry_02	b02, c07
EKry_fs_02	discussion classes	30	course work	EKry_01, EKry_02, EKry_03	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Entrepreneurship, Intellectual Property Protection**
Module code	W4-MT-S2-23-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_fs_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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Environmental Chemistry**
Module code	W4-MT-S2-23-ChŚ
Number of the ECTS credits	3
Language of instruction	Polish
Purpose and description of the content of education	Moduł Chemia środowiska ma za zadanie zapoznanie studenta z problemami obecności związków chemicznych w środowisku, jak i procesami chemicznymi zachodzącymi w różnych komponentach środowiska, tj. wodzie, glebie i atmosferze. Student poznaje sposoby ochrony środowiska naturalnego przed zanieczyszczeniami, degradację zanieczyszczeń zgodnie z zasadami zrównoważonego rozwoju, jak również metody zagospodarowania odpadów oraz powszechnie stosowane metody utylizacji. Potrafi dokonać klasyfikacji tworzyw sztucznych w zależności od ich właściwości i 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)
ChŚ_01	Dysponuje pogłębioną wiedzą w zakresie chemii środowiska, zna rodzaje zanieczyszczeń powietrza, wody i gleby. Zna ich źródła oraz wpływ na stan środowiska naturalnego.	KN_Ch_W01	4
ChŚ_02	Wymienia działania jakie powinny być wprowadzane w celu ograniczania zanieczyszczeń w środowisku.	KN_Ch_U01 KN_Ch_W02	4 3
ChŚ_03	Potrafi dokonać klasyfikacji tworzyw sztucznych w zależności od ich właściwości i zastosowania.	KN_Ch_U01 KN_Ch_W01 KN_Ch_W02	4 3 3
ChŚ_04	Zna chemiczne i instrumentalne metody stosowane w analizie zanieczyszczeń środowiska, w tym budowę i zasadę działania aparatury pomiarowej i sprzętu chemicznego.	KN_Ch_W03 KN_Ch_W04	3 3
ChŚ_05	Posiada pogłębioną wiedzę dotyczącą nowoczesnych technik pomiarowych stosowanych w analizie zanieczyszczeń środowiska.	KN_Ch_W03	3
ChŚ_06	Potrafi zaplanować i zorganizować prace badawcze zgodnie z zasadami bezpieczeństwa i dobrej praktyki laboratoryjnej oraz realizować je samodzielnie lub zespołowo.	KN_Ch_U05 KN_Ch_U06	3 3

ChŚ_07	Wykazuje umiejętność łączenia wiedzy z różnych gałęzi chemii i nauk pokrewnych oraz potrafi wytłumaczyć określone problemy z dziedziny ochrony środowiska.	KN_Ch_U01 KN_Ch_U05 KN_Ch_U07	4 3 3
ChŚ_08	Samodzielnie poznaje wybrane zagadnienia i określa kierunki dalszego kształcenia oraz rozumie konieczność stosowania interdyscyplinarnego podejścia opartego na krytycznym wnioskowaniu przy rozwiązywaniu problemów badawczych.	KN_Ch_K01 KN_Ch_K02 KN_Ch_U07	3 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*
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*
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
ChŚ_fs_01	workshop	30	course work	ChŚ_01, ChŚ_02, ChŚ_03, ChŚ_04, ChŚ_05, ChŚ_06, ChŚ_07, ChŚ_08	b02, b04, 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
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*	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Functional Analysis**
Module code	W4-MT-S2-23-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_fs_1	lecture	30	exam	AFun_1, AFun_2, AFun_3, AFun_4, AFun_5	a01
AFun_fs_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
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*	No

		well as from the notes or other materials/artifacts made in class	
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Fundamentals of Didactics II**
Module code	W4-MT-S2-23-PDyd2
Number of the ECTS credits	2
Language of instruction	Polish
Purpose and description of the content of education	Dydaktyka jako nauka interdyscyplinarna stawia w centrum swoich zainteresowań szeroko pojęty proces nauczania - uczenia się i możliwości jego kształtowania przez człowieka. przebiegu, regułach, którym podlega oraz na sposobach. Celem przedmiotu jest zapoznanie studentów z jego uwarunkowaniami – począwszy od czynników mogących zainicjować ów proces, poprzez determinanty jego przebiegu aż po rezultaty tak, aby ułatwić im zrozumienie stosownych mechanizmów i wdrożyć do pracy w zawodzie nauczyciela.
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 wyrównywania szans edukacyjnych, znaczenie odkrywania oraz rozwijania predyspozycji i uzdolnień oraz zagadnienia	KN.2023_U03 KN.2023_U04	1 1

	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	3 3 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, PDyd2_09, PDyd2_10,	b02, f02

				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
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
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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**General academic module (Humanities)**
Module code	OOD_2024_SS_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	30	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**General academic module (Social Sciences)**
Module code	OOD_2024_SS_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)
SMO1_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
SMO1_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
SMO1_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
SMO1_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	30	course work	SMO1_1, SMO1_2, SMO1_3, SMO1_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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Geometry in secondary school**
Module code	W4-MT-S2-23-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	KN.2023_W02 KN.2023_W04 KN.2023_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	3 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	30	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*	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
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*	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Graduate Seminar I**
Module code	W4-MT-S2-23-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_fs_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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	General information about the module
Module name	**Graduate Seminar II**
Module code	W4-MT-S2-23-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 K_U02 K_U09	4 4 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_fs_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	
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Graduate Workshop**
Module code	W4-MT-S2-23-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_fs_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
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*	Yes

		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.

1.	**Field of study**	**Mathematics**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Mathematical Competition Tasks**
Module code	W4-MT-S2-23-MZK
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 KN.2023_KS03 KN.2023_U04 KN.2023_U05 KN.2023_W02 KN.2023_W07	4 4 4 4 4 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	45	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Mathematical Foundations of Computer Science**
Module code	W4-MT-S2-23-MPInf
Number of the ECTS credits	3
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)
MPInf_01	Student zna pojęcie entropii oraz kodowania optymalnego; zna kodowanie Huffmana oraz kodowanie Shannona-Fano	K_W04	3
MPInf_02	Student zna i rozumie pojęcie złożoności obliczeniowej (czasowej i pamięciowej) oraz notacji asymptotycznej.	K_W04	3
MPInf_03	Student potrafi wyznaczać złożoność obliczeniową prostych algorytmów, w tym algorytmów rekurencyjnych.	K_U05	3
MPInf_04	Student zna podstawowe algorytmy numeryczne.	K_W05	3
MPInf_05	Student 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
MPInf_fs_01	lecture	15	course work	MPInf_01, MPInf_02, MPInf_04, MPInf_05	a01, c07
MPInf_fs_02	laboratory classes	15	course work	MPInf_01, MPInf_02, MPInf_03, MPInf_04, MPInf_05	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.

1.	**Field of study**	**Mathematics**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Mathematical modelling and computer simulation**
Module code	W4-MT-S2-23-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_fs_1	lecture	30	exam	MSKom_1, MSKom_2, MSKom_3, MSKom_4, MSKom_5, MSKom_6	b02
MSKom_fs_2	laboratory classes	30	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?
a03	Preparation for classes	Developing practical skills *activities involving the repetition, refinement and consolidation of practical skills, including those developed during previous classes or new skills necessary for the implementation of subsequent elements of the curriculum (as preparation for class participation)*	Yes
a04	Preparation for classes	Consulting materials complementary to those indicated in the syllabus *agreeing on materials complementary to those indicated in the syllabus, supporting the implementation of tasks resulting from or necessary for class participation*	Yes
b01	Consulting the curriculum and the organization of classes	Getting acquainted with the syllabus content *reading through the syllabus and getting acquainted with its content*	No
b02	Consulting the curriculum and the organization of classes	Verification / adjustment / discussion of syllabus provisions *consulting the content of the syllabus, possibly in the presence of the year tutor or members of the class group, and, if necessary, reassessing the provisions concerning special conditions for class participation, e.g., space and time requirements, technical and other requirements, including conditions for participation in classes outside the walls of the university, classes organized in blocks, organized online, etc.*	No
b03	Consulting the curriculum and the organization of classes	Consulting the schedule *getting acquainted with the class schedule, possibly in the presence of the year tutor, in order to 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*	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.

1.	**Field of study**	**Mathematics**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Modern Instrumental Techniques**
Module code	W4-MT-S2-23-NMI
Number of the ECTS credits	4
Language of instruction	Polish
Purpose and description of the content of education	Moduł Nowoczesne metody instrumentalne ma za zadanie zapoznanie studentów z wybranymi technikami spektroskopowymi i chromatograficznymi stosowanymi w analityce. Student poznaje podstawy teoretyczne w zakresie niezbędnym do zrozumienia zjawisk fizyko-chemicznych zachodzących podczas pomiaru instrumentalnego. Potrafi w podstawowym zakresie zinterpretować uzyskane wyniki. Student poznaje podstawy metod przygotowania próbek do analizy prowadzonej metodami instrumentalnymi.
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)
NMI_01	Zna techniki instrumentalne stosowane w analizie chemicznej.	KN_Ch_K01 KN_Ch_W01	2 2
NMI_02	Rozumie podstawy działania aparatury pomiarowej.	KN_Ch_K01 KN_Ch_U04 KN_Ch_W03	2 4 2
NMI_03	Potrafi przeprowadzić analizę jakościową i ilościową prostych związków chemicznych.	KN_Ch_U04 KN_Ch_U07	3 3
NMI_04	Interpretuje i opracowuje wyniki uzyskane technikami instrumentalnymi.	KN_Ch_U02 KN_Ch_U03 KN_Ch_U05 KN_Ch_W05	3 3 4 3
NMI_05	Jest odpowiedzialny za pracę własną i innych w laboratorium wyposażonym w aparaturę pomiarową.	KN_Ch_U06 KN_Ch_W06	4 4

NMI_06	Ma świadomość odpowiedzialności za wspólnie realizowane zadania, związane z pracą zespołową.	KN_Ch_K02 KN_Ch_U06	4 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*
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*
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
NMI_fs_01	laboratory classes	45	course work	NMI_01, NMI_02, NMI_03, NMI_04, NMI_05, NMI_06	b02, d01, d03, e01, 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?
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*	Yes

		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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Monograph Course**
Module code	W4-MT-S2-23-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_fs_1	lecture	30	exam	WMon_1, WMon_2, WMon_3, WMon_4, WMon_5, WMon_6, WMon_7	a02
WMon_fs_2	discussion classes	30	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?**
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 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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Monograph Course in English**
Module code	W4-MT-S2-23-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*
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
WMonE_fs_1	lecture	30	exam	WMonE_1, WMonE_2, WMonE_3, WMonE_4, WMonE_5, WMonE_6, WMonE_7, WMonE_8, WMonE_9	a02
WMonE_fs_2	discussion classes	30	course work	WMonE_1, WMonE_2, WMonE_3, WMonE_4, WMonE_5, WMonE_6, WMonE_7, WMonE_8, WMonE_9	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
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	
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*	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Operating systems with elements of computer architecture**
Module code	W4-MT-S2-23-SOAKom
Number of the ECTS credits	4
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	KN_NI_W01	4
SOAKom_2	Umie dobierać i konfigurować podstawowe karty rozszerzeń, testować wydajność komputera	KN_NI_U01 KN_NI_W01	3 2
SOAKom_3	Umie przygotowywać dysk twardy do instalacji systemu operacyjnego oraz zainstalować system operacyjny	KN_NI_U01	3
SOAKom_4	Potrafi skonfigurować wszystkie najważniejsze usługi systemów operacyjnych rodziny Windows i rodziny Linuks	KN_NI_U01 KN_NI_U03	3 1
SOAKom_5	Zna najważniejsze zadania systemu operacyjnego	KN_NI_W02	3

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_fs_1	lecture	15	course work	SOAKom_1, SOAKom_3, SOAKom_4, SOAKom_5	a03
SOAKom_fs_2	laboratory classes	45	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 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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Optional Lecture**
Module code	W4-MT-S2-23-WFak
Number of the ECTS credits	6
Language of instruction	Polish
Purpose and description of the content of education	Realizując Wykład fakultatywny student, kierując się swoimi zainteresowaniami, po konsultacji z opiekunem, dokonuje wyboru jednej z gałęzi matematyki w ramach wykładów dostępnych w ofercie wydziału. Wykłady fakultatywne realizowane na pierwszym semestrze mają na celu ugruntowanie i pogłębienie zdobytej przez studenta wiedzy z wybranej gałęzi matematyki. Wykład fakultatywny realizowany na kolejnym semestrze wprowadza studenta w bardziej zaawansowane techniki charakterystyczne dla wybranej gałęzi i wzbogaca wiedzę studenta w ramach wybranej gałęzi matematyki. Przedstawione na Wykładach fakultatywnych zagadnienia mają na celu dostarczenie studentowi szerokiej wiedzy z wybranej gałęzi matematyki oraz pobudzenie jego zainteresowań badawczych w obrębie wybranej gałęzi matematyki. Szczegółowe opisy poruszanej tematyki znajdują się w opisach oferowanych na wydziale wykładów fakultatywnych.
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)
WFak_1	zna większość definicji i twierdzeń wraz z dowodami	K_U05 K_W04	5 4
WFak_2	rozumie sformułowania problemów otwartych i zagadnień pozostających na etapie badań	K_K05 K_W05	5 5
WFak_3	umie na poziomie zaawansowanym stosować i przedstawiać w mowie i piśmie metody wybranej gałęzi matematyki	K_K01 K_U05 K_W04	5 5 5
WFak_4	ma świadomość potrzeby uzupełnienia i poszerzenia swej wiedzy poprzez dalsze studiowanie literatury	K_K01	5

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**
WFak_fs_1	lecture	30	course work	WFak_1, WFak_2, WFak_3, WFak_4	a01
WFak_fs_2	discussion classes	30	course work	WFak_1, WFak_2, WFak_3, WFak_4	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
a03	Preparation for classes	Developing practical skills *activities involving the repetition, refinement and consolidation of practical skills, including those developed during previous classes or new skills necessary for the implementation of subsequent elements of the curriculum (as preparation for class participation)*	Yes
a04	Preparation for classes	Consulting materials complementary to those indicated in the syllabus *agreeing on materials complementary to those indicated in the syllabus, supporting the implementation of tasks resulting from or necessary for class participation*	Yes
b01	Consulting the curriculum and the organization of classes	Getting acquainted with the syllabus content *reading through the syllabus and getting acquainted with its content*	No
b02	Consulting the curriculum and the organization of classes	Verification / adjustment / discussion of syllabus provisions *consulting the content of the syllabus, possibly in the presence of the year tutor or members of the class group, and, if necessary, reassessing the provisions concerning special conditions for class participation, e.g., space and time requirements, technical and other requirements, including conditions for participation in classes outside the walls of the university, classes organized in blocks, organized online, etc.*	No
b03	Consulting the curriculum and the organization of classes	Consulting the schedule *getting acquainted with the class schedule, possibly in the presence of the year tutor, in order to 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	No

		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.*	
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Physical Chemistry with Elektrochemistry**
Module code	W4-MT-S2-23-ChFzE
Number of the ECTS credits	4
Language of instruction	Polish
Purpose and description of the content of education	Zadaniem modułu Chemia fizyczna z elektrochemią jest zapoznanie studentów z najbardziej istotnymi pojęciami z termodynamiki, kinetyki chemicznej oraz elektrochemii, takimi jak: układ, otoczenie, sposoby przekazywania energii, energetyka reakcji chemicznych, entalpia, szybkość reakcji chemicznej, wpływ stężenia, temperatury i innych czynników na szybkość reakcji chemicznych, energia aktywacji, katalizator, szereg aktywności pierwiastków, metali, półogniwo i ogniwo chemiczne, siła elektromotoryczna ogniwa, elektroliza, ochrona metali przed korozją. Student potrafi przeprowadzić doświadczenia ilustrujące wybrane zagadnienia z zakresu chemii fizycznej. Nabiera umiejętności potrzebnych do przeprowadzania i projektowania doświadczeń dotyczących energetyki reakcji, kinetyki chemicznej i elektrochemii. Potrafi rozwiązywać zadania obliczeniowe i problemowe z zakresu chemii fizycznej oraz interpretować zjawiska w otoczeniu z wykorzystaniem pojęć z tej dziedziny.
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)
ChFzE_01	Potrafi objaśnić najistotniejsze pojęcia z termodynamiki, kinetyki oraz elektrochemii.	KN_Ch_W01	5
ChFzE_02	Używa języka naukowego przy interpretacji zjawisk oraz podczas dyskusji.	KN_Ch_U01 KN_Ch_U05	5 5
ChFzE_03	Zna zasady termodynamiki i wynikające z nich relacje dotyczące procesów równowagowych z zakresu kinetyki i elektrochemii.	KN_Ch_W01	4
ChFzE_04	Krytycznie ocenia zasób swojej wiedzy, dba o jakość wykonywanych zadań, rozumie konieczność łączenia z różnych dziedzin oraz potrzebę ciągłego kształcenia.	KN_Ch_K01	5
ChFzE_05	Zna metody obliczeniowe z zakresu chemii fizycznej i potrafi je zastosować do opracowywania wyników eksperymentalnych.	KN_Ch_W05	4
ChFzE_06	Rozwiązuje zadania rachunkowe z chemii fizycznej dotyczące procesów równowagowych.	KN_Ch_U02	3
ChFzE_07	Potrafi zaproponować metodę wyznaczenia określonej wielkości fizykochemicznej substancji oraz zbudować prosty sprzęt do pomiaru wybranych wielkości z zakresu termochemii, kinetyki oraz elektrochemii.	KN_Ch_U04	5

		KN_Ch_U06	5
ChFzE_08	Opracowuje sprawozdania z zakresu chemii fizycznej wykorzystując rachunek błędów i statystykę matematyczną dla oceny wiarygodność uzyskanych wyników.	KN_Ch_U02 KN_Ch_W05	4 3
ChFzE_09	Ma świadomość odpowiedzialności za wspólnie realizowane zadania, związane z pracą zespołową oraz za bezpieczeństwo pracy w laboratorium fizykochemicznym.	KN_Ch_K02 KN_Ch_U06	4 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*
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*
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*
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**
ChFzE_fs_01	lecture	15	exam	ChFzE_01, ChFzE_02, ChFzE_03, ChFzE_04	a01, b02
ChFzE_fs_02	laboratory classes	15	course work	ChFzE_02, ChFzE_05, ChFzE_07, ChFzE_08, ChFzE_09	b09, e01, f02
ChFzE_fs_03	discussion classes	30	course work	ChFzE_01, ChFzE_02, ChFzE_03, ChFzE_04, ChFzE_06, ChFzE_09	b02, b09, f02

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
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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Praktyka nauczycielska z informatyki, tutoring I**
Module code	W4-MT-S2-23-PITut1
Number of the ECTS credits	2
Language of instruction	Polish
Purpose and description of the content of education	Celem śródrocznej praktyki dydaktycznej prowadzonej w szkole ponadpodstawowej jest gromadzenie doświadczeń związanych z pracą dydaktyczno–wychowawczą nauczyciela na III etapie edukacyjnym oraz konfrontowanie nabytej wiedzy z zakresu informatyki, dydaktyki ogólnej i dydaktyki informatyki z rzeczywistością pedagogiczną w działaniu praktycznym. W trakcie praktyki następuje kształtowanie podstawowych kompetencji dydaktycznych poprzez: - zapoznanie się ze specyfiką szkoły, w której odbywana jest praktyka dydaktyczna, w szczególności poznanie realizowanych przez szkołę zadań dydaktycznych, sposobu funkcjonowania, organizacji pracy, różnych pracowników - uczestników procesów pedagogicznych oraz prowadzonej dokumentacji; - obserwowanie aktywności uczniów oraz wszelkich czynności podejmowanych przez nauczyciela szkoły w toku prowadzonych przez niego lekcji (zajęć); - współdziałanie z nauczycielem i prowadzącym zajęcia w planowaniu i przeprowadzaniu lekcji informatyki; - pełnienie roli nauczyciela, w szczególności planowanie lekcji informatyki na II etapie edukacyjnym, formułowanie celów, dobór metod i form pracy oraz środków dydaktycznych, organizację i prowadzenie lekcji w oparciu o samodzielnie opracowywane scenariusze oraz omawianie zgromadzonych doświadczeń w grupie studentów (słuchaczy); - odpowiednie reagowanie na uwagi dotyczące przygotowania oraz prowadzenia lekcji. W module tym przewiduje się również personalizację procesu kształcenia przyszłego nauczyciela informatyki budowaną w oparciu o indywidualną opiekę nad studentem (tutoring): - diagnozowanie mocnych i słabych stron studenta jako przyszłego nauczyciela; - wspomaganie studentów w planowaniu i realizacji zadań o charakterze samorozwojowym; - indywidualne doradztwo metodyczne.
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)
PITut1_1	student zna zadania dydaktyczne realizowane przez szkołę lub placówkę systemu oświaty	KN.2023_W08 KN.2023_W09	3 3

PITut1_2	student zna sposób funkcjonowania oraz organizację pracy dydaktycznej szkoły lub placówki systemu oświaty	KN.2023_W08 KN.2023_W09 KN.2023_W11	3 3 3
PITut1_3	student zna rodzaje dokumentacji działalności dydaktycznej prowadzonej w szkole lub placówce systemu oświaty	KN.2023_U04 KN.2023_W08 KN.2023_W09	3 3 3
PITut1_4	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 KN.2023_U02 KN.2023_U08 KN.2023_U09 KN.2023_U10 KN.2023_W02 KN.2023_W04 KN.2023_W12 KN.2023_W15	3 3 2 3 2 3 2 3 3
PITut1_5	student potrafi zaplanować i przeprowadzić pod nadzorem opiekuna praktyk zawodowych serię lekcji lub zajęć	KN.2023_U02 KN.2023_U03 KN.2023_U15 KN.2023_W02 KN.2023_W04 KN.2023_W14	3 3 3 3 3 3
PITut1_6	student potrafi analizować sytuacje i zdarzenia pedagogiczne zaobserwowane lub doświadczone w czasie praktyk	KN.2023_U01 KN.2023_U02 KN.2023_U03 KN.2023_U04 KN.2023_W02 KN.2023_W04 KN.2023_W15	3 3 3 3 3 3 3
PITut1_7	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 KN.2023_KS03 KN.2023_KS05 KN.2023_KS07	3 3 3 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*
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*

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**
PITut1_fs_01	workshop	30	course work	PITut1_1, PITut1_2, PITut1_3, PITut1_4, PITut1_5, PITut1_6, PITut1_7	e05
PITut1_fs_02	tutoring	1	course work	PITut1_4, PITut1_6	b04

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
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
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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Problem Workshops A**
Module code	W4-MT-S2-23-WProA
Number of the ECTS credits	1
Language of instruction	Polish
Purpose and description of the content of education	Celem wiodącym jest zapoznanie studentów na możliwie ogólnym poziomie z tematyką podejmowaną przez (wybrane) grupy badawcze Instytutu Matematyki, w szczególności ze standardowymi narzędziami stosowanymi w danych działach matematyki. Celami pośrednimi są: kształcenie umiejętności analitycznych (właściwe zdefiniowanie problemu), metodycznych (wybór optymalnego narzędzia do rozwiązania danego problemu) i poznawczych (analiza publikacji i innych materiałów, w tym obcojęzycznych, związanych z danym problemem).
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)
WProA_1	Zna i rozumie najważniejsze twierdzenia i hipotezy z wybranych działów matematyki	K_W03	3
WProA_2	Potrafi właściwie zdefiniować problem związany z danym zagadnieniem poprzez stawianie precyzyjnych i trafnych pytań	K_K02	4
WProA_3	W oparciu o literaturę fachową potrafi przygotować i zaprezentować ustnie dane zagadnienie	K_K04 K_U02 K_U09	4 4 4
WProA_4	Potrafi określić swoje zainteresowania i rozwijać je w toku dalszych studiów	K_K01 K_U06	3 3

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*

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
WProA_fs_1	workshop	30	course work	WProA_1, WProA_2, WProA_3, WProA_4	a03, 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?
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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Problem Workshops B**
Module code	W4-MT-S2-23-WProB
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_fs_1	workshop	30	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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Programming**
Module code	W4-MT-S2-23-Pro
Number of the ECTS credits	6
Language of instruction	Polish
Purpose and description of the content of education	Wykład przedstawia techniki programowania w jednym z języków wysokiego poziomu (C++, C#) . 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)
Pro_S2_1	Student potrafi pisać programy przetwarzające pliki oraz komunikujące się poprzez standardowe wejście i wyjście.	KN_NI_U04 KN_NI_U05 KN_NI_W06 KN_NI_W07	5 3 5 3
Pro_S2_2	Student ma uporządkowaną wiedzę w zakresie składni języka wysokiego poziomu. Student zna w stopniu podstawowym zasady konstruowania programów wielomodułowych.	KN_NI_U04 KN_NI_U05 KN_NI_W06 KN_NI_W07	3 5 5 3
Pro_S2_3	Student zna podstawowe pojęcia związane z programowaniem obiektowym.	KN_NI_U04 KN_NI_U05	3 5

		KN_NI_W06 KN_NI_W07	5 3
Pro_S2_4	Student potrafi współpracować w zespole pracującym nad różnymi aspektami tego samego projektu.	K_K03 KN.2023_KS01	3 3

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	Pro_S2_1, Pro_S2_2, Pro_S2_3	b01
PZaw_fs_02	laboratory classes	45	course work	Pro_S2_1, Pro_S2_2, Pro_S2_3, Pro_S2_4	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Proseminar**
Module code	W4-MT-S2-23-Pros
Number of the ECTS credits	3
Language of instruction	Polish
Purpose and description of the content of education	Celem modułu jest wykształcenie umiejętności pracy z tekstem matematycznym (fragmenty monografii, artykuły, w tym obcojęzyczne), przygotowania na jego podstawie referatu oraz jego prezentacji na forum grupy.
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)
Pros_1	Zna i rozumie rolę i znaczenie konstrukcji rozumowań matematycznych	K_W02	3
Pros_2	Potrafi weryfikować poprawność analizowanych rozumowań	K_U03	4
Pros_3	Potrafi formułować pytania służące pogłębianiu własnej wiedzy związane zarówno z opracowywanym zagadnieniem jak i z prezentacjami innych uczestników proseminarium	K_K02 K_K05	3 3
Pros_4	Potrafi zredagować pisemnie oraz zaprezentować w jasny i przystępny sposób na forum grupy zadany fragment publikacji	K_U02 K_U08 K_U09	5 5 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
Pros_fs_1	seminar	45	course work	Pros_1, Pros_2, Pros_3, Pros_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?
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Psychological and Pedagogical Practice**
Module code	W4-MT-S2-23-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_U01 KN.2023_U03 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_NI_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_fs_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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Psychological and Pedagogical Workshops**
Module code	W4-MT-S2-23-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)
PED-WAR_01	absolwent zna znaczenie pozycji szkoły jako instytucji edukacyjnej, funkcje i cele edukacji szkolnej, (B.2.W1.)	KN.2023_W04 KN.2023_W08 KN.2023_W09	2 2 3
PED-WAR_02	absolwent zna podstawę programową w kontekście programu nauczania oraz działania wychowawczo-profilaktyczne, (B.2.W1.)	KN.2023_W14	4
PED-WAR_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 KN.2023_W04	3 3

	uczniów, rolę początkującego nauczyciela w szkolnej rzeczywistości, uwarunkowania sukcesu w pracy nauczyciela; (B.2.W2.)	KN.2023_W11	3
PED-WAR_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
PED-WAR_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
PED-WAR_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
PED-WAR_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
PED-WAR_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
PED-WAR_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
PED-WAR_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
PED-WAR_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
PED-WAR_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
PED-WAR_13	absolwent stara się formułować oceny etyczne związane z wykonywaniem zawodu nauczyciela; (B.2.U3)	KN.2023_U06 KN.2023_U10	2 3

PED-WAR_14	absolwent jest gotów do okazywania empatii uczniom oraz zapewniania im wsparcia i pomocy; (B.2.K1)	KN.2023_KS02	2
PED-WAR_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
PED-WAR_16	absolwent jest gotów do samodzielnego pogłębiania wiedzy pedagogicznej; (B.2.K3)	KN.2023_U18	2
PED-WAR_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**
PED-WAR_fs_1	workshop	30	course work	PED-WAR_01, PED-WAR_02, PED-WAR_03, PED-WAR_04, PED-WAR_05, PED-WAR_06, PED-WAR_07, PED-WAR_08, PED-WAR_09, PED-WAR_10, PED-WAR_11, PED-WAR_12, PED-WAR_13, PED-WAR_14, PED-WAR_15, PED-WAR_16, PED-WAR_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.

1.	**Field of study**	**Mathematics**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Psychology**
Module code	W4-MT-S2-23-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_fs_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_fs_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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Robotics - laboratory**
Module code	W4-MT-S2-23-PRobIn
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 zastosowań matematyki i fizyki w programowaniu. Na zajęciach studenci poznają działanie serwomotorów, czujników: podczerwieni, koloru i światła, dotyku , głosu, ultradźwiękowego, żyroskopu, magnetycznego. Materiały do zajęć będą się znajdować na platformie e- learningowej. Wykorzystywany język C++ lub PYTHON.
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.	KN_NI_W05 KN_NI_W06 K_U07	5 5 2
PRobin2	Student potrafi pracować w zespole oraz organizować jego pracę. Szanuje pracę innych osób z zespołu	K_K03 K_U10 K_W06	1 1 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
PRobinS	laboratory classes	30	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Robotics for Math Teachers**
Module code	W4-MT-S2-23-RobNMat
Number of the ECTS credits	1
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)
RobNMatS1	Student zna pojęcia związane z budową robotów, różnymi czujnikami ich zastosowaniem oraz programowaniem.	KN_NI_U04 KN_NI_U05 KN_NI_U06 KN_NI_W05 KN_NI_W06 K_U07	3 5 4 5 5 2
RobNMatS2	Student potrafi pracować w zespole oraz organizować jego pracę. Szanuje pracę innych osób z zespołu.	K_K03 KN.2023_KS07 KN_NI_K01 KN_NI_K02 KN_NI_W07 K_U10 K_W06	1 1 1 2 1 1 1
RobNMatS3	Student potrafi wykorzystać elementy robotyki w nauczaniu matematyki oraz zorganizować zajęcia dla dzieci z różnymi potrzebami edukacyjnymi.	KN.2023_U02	3

		KN.2023_U03 KN.2023_U06 KN.2023_U07 KN.2023_U12 KN.2023_U15 KN.2023_W05 KN.2023_W06 KN.2023_W15	3 3 3 3 3 1 1 1
RobNMatS4	Student zna i stosuje zasady bhp w pracowni komputerowej.	KN_NI_U12 KN_NI_W12	5 5
RobNMatS5	Student widzi potrzebę dokształcania się w dziedzinie nowych technologii.	K_K01 KN.2023_U18	5 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**
RobNMatS	laboratory classes	15	course work	RobNMatS1, RobNMatS2, RobNMatS3, RobNMatS4, RobNMatS5	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Scientific English**
Module code	W4-MT-S2-23-SEng
Number of the ECTS credits	3
Language of instruction	English
Purpose and description of the content of education	Moduł Scientific English ma na celu przygotowanie słuchaczy do pracy z tekstem matematycznym po angielsku, samodzielnego redagowania uzyskiwanych wyników oraz wygłaszania referatów w tym języku. Zostaną zbadane przykłady różnych rodzajów tekstu matematycznego i języka używanego. Studenci będą mieli okazję do praktykowania szeregu zadań pisemnych, zarówno indywidualnie, jak i wspólnie.
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)
SEng_1	potrafi przedstawiać w języku angielskim wyniki przeprowadzanych badań oraz samodzielnie redagować tekst matematyczny w języku angielskim	K_U05 K_U08	4 5
SEng_2	nabył kompetencje w zakresie przekazywania wiedzy, a także jej popularyzowania w j. angielskim w formie np. referatów, prelekcji, wykładów, publikacji itp.	K_K04 K_U08 K_U09	4 5 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*
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

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
SEng_fs_1	discussion classes	30	course work	SEng_1, SEng_2	b04, b09

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)*	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
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
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Selected problems of school mathematics in tasks**
Module code	W4-MT-S2-23-WZMSzk
Number of the ECTS credits	2
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 KN.2023_U04 KN.2023_W14	3 3 3
WZMSzk_05	Student jest gotów do stymulowania uczniów do uczenia się przez całe życie przez samodzielną pracę.	KN.2023_U06 KN.2023_U10 KN.2023_W02 KN.2023_W03	4 4 4 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*	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

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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Seminar 1**
Module code	W4-MT-S2-23-Sem1
Number of the ECTS credits	2
Language of instruction	Polish
Purpose and description of the content of education	Tematykę Seminarium 1 określa wybrany przez studentów prowadzący. Student, poprzez aktywne uczestnictwo w Seminarium 1, utrwala posiadaną wiedzę, poznaje elementy najnowszej literatury matematycznej, uczy się samodzielnie opracowywać zagadnienia ze współczesnej matematyki, prezentuje własne opracowania tekstu matematycznego i bierze aktywny udział w dyskusji nad poruszanymi zagadnieniami. Głównym celem Seminarium 1 jest doskonalenie umiejętności pracy studenta nad tekstem matematycznym i rozwijanie umiejętności aktywnego uczestnictwa studenta w dyskusji nad konkretnymi problemami badawczymi.
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)
Sem1_1	dobrze rozumie rolę i znaczenie rozumowań matematycznych	K_K05 K_U03	4 5
Sem1_2	potrafi posługiwać się literaturą, także obcojęzyczną, w celu przygotowania referatu	K_K02 K_U03 K_U09 K_W05	5 5 5 4
Sem1_3	umie na poziomie zaawansowanym stosować i przedstawiać w mowie i piśmie metody matematyki współczesnej	K_K02 K_K05 K_U03 K_U06 K_U09 K_W05	5 5 5 4 5 5

Sem1_4	zna ograniczenie własnej wiedzy i rozumie potrzebę jej poszerzania	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*
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
Sem1_fs_1	seminar	30	course work	Sem1_1, Sem1_2, Sem1_3, Sem1_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*	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
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	No

		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	

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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Seminar 2**
Module code	W4-MT-S2-23-Sem2
Number of the ECTS credits	3
Language of instruction	Polish
Purpose and description of the content of education	Tematykę Seminarium 1 określa wybrany przez studentów prowadzący. Student, poprzez aktywne uczestnictwo w Seminarium 1, utrwala posiadaną wiedzę, poznaje elementy najnowszej literatury matematycznej, uczy się samodzielnie opracowywać zagadnienia ze współczesnej matematyki, prezentuje własne opracowania tekstu matematycznego i bierze aktywny udział w dyskusji nad poruszanymi zagadnieniami. Głównym celem Seminarium 1 jest doskonalenie umiejętności pracy studenta nad tekstem matematycznym i rozwijanie umiejętności aktywnego uczestnictwa studenta w dyskusji nad konkretnymi problemami badawczymi.
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)
Sem2_1	dobrze rozumie rolę i znaczenie rozumowań matematycznych	K_K05 K_U03	4 5
Sem2_2	potrafi posługiwać się literaturą, także obcojęzyczną, w celu przygotowania referatu	K_K02 K_U03 K_U09 K_W05	5 5 5 4
Sem2_3	umie na poziomie zaawansowanym stosować i przedstawiać w mowie i piśmie metody matematyki współczesnej	K_K02 K_K05 K_U03 K_U06 K_U09 K_W05	5 5 5 4 5 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**
Sem2_fs_1	seminar	45	course work	Sem2_1, Sem2_2, Sem2_3	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*	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
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*	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Specialized Module**
Module code	W4-MT-S2-23-MSpe
Number of the ECTS credits	6
Language of instruction	Polish
Purpose and description of the content of education	Opis zawartości modułu: 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_01	ma ogólną wiedzę w zakresie zaawansowanych kompetencji, zasad i teorii omawianych na danym wykładzie specjalistycznym	K_W04	5
MSpe_02	ma rozszerzoną wiedzę w zakresie zagadnień omawianych na danym wykładzie specjalistycznym	K_U06 K_W04	4 5
MSpe_03	potrafi opisać historyczny rozwój i określić znaczenie omawianych na wykładzie zagadnień dla postępu nauk przyrodniczych	K_U08 K_W05	5 3
MSpe_04	potrafi analizować problemy oraz znajdować ich rozwiązania w oparciu o poznane na wykładzie twierdzenia I metody badawcze	K_K02 K_U05	5 4
MSpe_05	potrafi stosować metody numeryczne do rozwiązywania problemów omawianych na wykładzie	K_U05	3

MSpe_06	potrafi zastosować zdobytą wiedzę do zagadnień pokrewnych z omawianymi na wykładzie	K_K06 K_U07	3 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_fs_1	lecture	30	exam	MSpe_01, MSpe_02	a01
MSpe_fs_2	laboratory classes	30	course work	MSpe_03, MSpe_04, MSpe_05, MSpe_06	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*	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
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	Yes

		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.

1.	Field of study	Mathematics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	General information about the module
Module name	**Specialized Subject**
Module code	W4-MT-S2-23-PSpe
Number of the ECTS credits	3
Language of instruction	Polish
Purpose and description of the content of education	Opis zawartości modułu ‘Przedmiot 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 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)
PSpe_1	Ma ogólną wiedzę w zakresie zaawansowanych kompetencji, zasad i teorii omawianych na danym wykładzie specjalistycznym	K_W04	5
PSpe_2	Ma rozszerzoną wiedzę w zakresie zagadnień omawianych na danym wykładzie specjalistycznym	K_U06 K_W04	4 5
PSpe_3	Potrafi analizować problemy oraz znajdować ich rozwiązania w oparciu o poznane na wykładzie twierdzenia I metody badawcze	KN_NI_K02 K_U05	5 4
PSpe_4	Potrafi zastosować zdobytą wiedzę do zagadnień pokrewnych z omawianymi na wykładzie	K_K06 K_U07	3 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*

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
PSpe_fs_1	lecture	15	course work	PSpe_1, PSpe_2, PSpe_3, PSpe_4	b02
PSpe_fs_2	laboratory classes	15	course work	PSpe_1, PSpe_2, PSpe_3, PSpe_4	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
a03	Preparation for classes	Developing practical skills *activities involving the repetition, refinement and consolidation of practical skills, including those developed during previous classes or new skills necessary for the implementation of subsequent elements of the curriculum (as preparation for class participation)*	Yes
a04	Preparation for classes	Consulting materials complementary to those indicated in the syllabus *agreeing on materials complementary to those indicated in the syllabus, supporting the implementation of tasks resulting from or necessary for class participation*	Yes
b01	Consulting the curriculum and the organization of classes	Getting acquainted with the syllabus content *reading through the syllabus and getting acquainted with its content*	No
b02	Consulting the curriculum and the organization of classes	Verification / adjustment / discussion of syllabus provisions *consulting the content of the syllabus, possibly in the presence of the year tutor or members of the class group, and, if necessary, reassessing the provisions concerning special conditions for class participation, e.g., space and time requirements, technical and other requirements, including conditions for participation in classes outside the walls of the university, classes organized in blocks, organized online, etc.*	No
b03	Consulting the curriculum and the organization of classes	Consulting the schedule *getting acquainted with the class schedule, possibly in the presence of the year tutor, in order to 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*	Yes

		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	
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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Statistics**
Module code	W4-MT-S2-23-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_fs_1	lecture	30	exam	Stat_1, Stat_2, Stat_7	a01, f02
Stat_fs_2	laboratory classes	30	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Stochastic Methods**
Module code	W4-MT-S2-23-MSto
Number of the ECTS credits	6
Language of instruction	Polish
Purpose and description of the content of education	Celem przedmiotu jest zapoznanie studentów z podstawowymi metodami analizy stochastycznej oraz jej zastosowaniami w matematyce finansowej. Treści programowe: 1.Warunkowa wartość oczekiwana. Momenty stopu. Martyngały. 2.Całka stochastyczna. Wzór Ito. 3.Równania stochastyczne. 4.Zastosowania w matematyce finansowej.
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	4
MSto _2	dobrze rozumie rolę i znaczenie konstrukcji rozumowań matematycznych	K_W02	4
MSto _3	zna podstawy modelowania stochastycznego w naukach ekonomicznych	K_U07	3
MSto _4	posiada umiejętności wyrażania treści matematycznych, w mowie i na piśmie, w tekstach matematycznych o różnym charakterze	K_U05	4
MSto _5	posiada umiejętność sprawdzania poprawności wnioskowania w budowaniu dowodów formalnych	K_U03	4
MSto _6	zna podstawowe pojęcia i metody procesów stochastycznych i potrafi je stosować w zagadnieniach praktycznych	K_W04	4
MSto _7	rozpoznaje struktury matematyczne w wybranych zagadnieniach matematyki finansowej	K_W04	3
MSto _8	potrafi stosować procesy stochastyczne jako narzędzie do modelowania zjawisk i analizy ich ewolucji	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*
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_fs_1	lecture	30	course work	MSto _1, MSto _2, MSto _3, MSto _6, MSto _7, MSto _8	a01
MSto_fs_2	discussion classes	30	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	Yes

		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.*	
c02	Preparation for verification of learning outcomes	Studying the literature used in and the materials produced in class *exploring the studied content, inquiring, considering, assimilating, interpreting it, or organizing knowledge obtained from the literature, documentation, instructions, scenarios, etc., used in class as well as from the notes or other materials/artifacts made in class*	Yes
d01	Consulting the results of the verification of learning outcomes	Analysis of the corrective feedback provided by the academic teacher on the results of the verification of learning outcomes *reading through the academic teacher's comments, assessments and opinions on the implementation of the task aimed at checking the level of the achieved learning outcomes*	Yes

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

1.	**Field of study**	**Mathematics**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Team Project**
Module code	W4-MT-S2-23-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 K_K06	3 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_fs_01	laboratory classes	30	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
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*	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	2024/2025 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Website design**
Module code	W4-MT-S2-23-PWInt
Number of the ECTS credits	6
Language of instruction	Polish
Purpose and description of the content of education	Zajęcia mają na celu: •zapoznać studentów z hipertekstowym językiem znaczników HTML, językiem służącym do opisu formy prezentacji – CSS oraz podstawami skryptowego języka programowania – PHP. •ukazać możliwość umieszczenia strony internetowej na serwerze lokalnym. •przedstawić dynamiczną witrynę internetową pobierającą dane z przygotowanej 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)
PWInt_1	zna systemy bazodanowe, rozumie ich rolę oraz zasady funkcjonowania	KN_NI_W08	1
PWInt_2	zna zasady projektowania responsywnych stron internetowych oraz umieszczania ich w sieci	KN_NI_W09	5
PWInt_3	zna zasady bhp przy obsłudze sprzętu komputerowego	KN_NI_W12	5
PWInt_4	zna i rozumie zasady korzystania z platform e-learningowych	KN_NI_U07 KN_NI_W07	1 2
PWInt_5	potrafi projektować serwisy internetowe z wykorzystaniem nowoczesnych technologii	KN_NI_K01 KN_NI_U08	1 5
PWInt_6	potrafi projektować i zarządzać bazami danych	KN_NI_U09	1
PWInt_7	potrafi współpracować w grupie oraz organizować pracę grupy podczas realizacji wspólnych projektów informatycznych	KN_NI_U11	3

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*
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**
PWInt_fs_1	lecture	15	course work	PWInt_1, PWInt_2, PWInt_3, PWInt_4, PWInt_5, PWInt_6	a03
PWInt_fs_2	laboratory classes	45	course work	PWInt_1, PWInt_2, PWInt_3, PWInt_4, PWInt_5, PWInt_6, PWInt_7	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	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.