

1.	Field of study	Water Management - Aquamatics
2.	Faculty	Faculty of Natural Sciences
3.	Academic year of entry	2025/2026 (winter term)
4.	Level of qualifications/degree	first-cycle studies (in engineering)
5.	Degree profile	general academic
6.	Mode of study	Full-time

7.	General information about the module	
Module name		Basics of chemical analytics
Module code		W2-GW-AQ-S1-018
Number of the ECTS credits		4
Language of instruction		Polish
Purpose and description of the content of education		Przedmiot analityka chemiczna realizowany w trakcie wykładów i zajęć laboratoryjnych ma za zadanie zapoznać studentów z zagadnieniami związanymi z wiedzą teoretyczną i praktyczną dotyczącą podstaw i praktyki klasycznych metod oznaczania i rozdzielania stosowanych w analizie chemicznej. Realizacja zajęć ma służyć zdobyciu praktycznych umiejętności pozwalających na przeprowadzenie analizy jakościowej i ilościowej próbek wykorzystując poznane metody analizy klasycznej. W toku zajęć studenci nabędą wiedzę dotyczącą metod obliczeniowych i statystycznych stosowanych w obliczeniach związanych z oceną zawartości składników w próbce. Studenci poznają również podstawy przygotowywania sprawozdań z wykonanych badań i interpretacji otrzymanych danych.
List of modules that must be completed before starting this module (if necessary)		[W2-GW-AQ-S1-012] Basics of chemistry

8.	Learning outcomes of the module			
Code	Description	Learning outcomes of the programme	Level of competenc (scale 1-5)	
W2-GW-AQ-S1-018 _1	Zna podstawowe metody badawcze stosowane w analizie chemicznej, potrafi korzystać ze źródeł informacji z zakresu chemii analitycznej.	GW-AQ1_W01 GW-AQ1_W02	4 4	
W2-GW-AQ-S1-018 _10	Opracowuje sprawozdania z przeprowadzonych analiz, ocenia wiarygodność otrzymanych wyników stosując podstawy rachunku błędów.	GW-AQ1_K01 GW-AQ1_U02 GW-AQ1_U03 GW-AQ1_W08	2 2 2 2	
W2-GW-AQ-S1-018 _2	Rozumie pojęcia związane z analizą chemiczną wód.	GW-AQ1_U02 GW-AQ1_W02	4 4	
W2-GW-AQ-S1-018 _3	Zna podstawowe metody klasycznej analizy jakościowej wybranych kationów i anionów.	GW-AQ1_U02 GW-AQ1_W02	3 3	
W2-GW-AQ-	Potrafi zaproponować metodę analizy klasycznej w zależności od właściwości analitu.	GW-AQ1_U02	3	

S1-018 _4		GW-AQ1_U03	3
W2-GW-AQ-S1-018 _5	Potrafi wykonać i interpretować podstawowe opracowania w zakresie analizy chemicznej wód.	GW-AQ1_U02 GW-AQ1_U03 GW-AQ1_W08	3 3 3
W2-GW-AQ-S1-018 _6	Zna wagowe i miareczkowe metody analizy chemicznej.	GW-AQ1_W01 GW-AQ1_W02	2 2
W2-GW-AQ-S1-018 _7	Potrafi wybrać odpowiednie metody poboru, przygotowania oraz rozdzielania i zatężania badanych materiałów.	GW-AQ1_U02 GW-AQ1_U03 GW-AQ1_W08	3 3 3
W2-GW-AQ-S1-018 _8	Potrafi posługiwać się szkłem i podstawowym sprzętem stosowanym w laboratorium analitycznym.	GW-AQ1_U02 GW-AQ1_U03 GW-AQ1_W08	2 2 2
W2-GW-AQ-S1-018 _9	Wykazuje wiedzę z zakresu podstawowych metod obliczeniowych i statystycznych, aby wyliczyć zawartość poszczególnych składników badanych mieszanin.	GW-AQ1_U02 GW-AQ1_U03 GW-AQ1_W08	2 3 2

9. Methods of conducting classes		
Code	Category	Name (description)
a01	Lecture methods / expository methods	Formal lecture/ course-related lecture <i>a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided</i>
a05	Lecture methods / expository methods	Explanation/clarification <i>explication involving the derivation of a predetermined theorem from other, already known ones, in the number of steps specified by the person teaching the course</i>
b01	Problem-solving methods	Problem-based lecture <i>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</i>
c06	Demonstration methods	Demonstration-imitation <i>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</i>
d02	Programmed learning methods	Working with a programmed textbook <i>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.</i>
e01	Practical methods	Laboratory exercise / experiment <i>[also conducted as fieldwork] a method of practical application of knowledge; implemented in three stages: the recognition of a problem induced by the task content, the formulation of the problem and the attempt to solve it accompanied by the assessment of the effects; the goal is to acquire skills, abilities and habits, and to consolidate the acquired knowledge so that it becomes operational; the laboratory method assumes greater independence of learners than carrying out an experiment</i>

e04	Practical methods	Project scheduling <i>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</i>
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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
W2-GW-AQ_018 fs 1	lecture	15	exam	W2-GW-AQ-S1-018_1, W2-GW-AQ-S1-018_2, W2-GW-AQ-S1-018_3, W2-GW-AQ-S1-018_6, W2-GW-AQ-S1-018_9	a01, b01
W2-GW-AQ_018 fs 2	laboratory classes	30	exam	W2-GW-AQ-S1-018_10, W2-GW-AQ-S1-018_4, W2-GW-AQ-S1-018_5, W2-GW-AQ-S1-018_7, W2-GW-AQ-S1-018_8	a05, c06, d02, e01, e04

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 <i>activities involving the repetition, refinement and consolidation of practical skills, including those developed during previous classes or new skills necessary for the implementation of subsequent elements of the curriculum (as preparation for class participation)</i>	No
a04	Preparation for classes	Consulting materials complementary to those indicated in the syllabus <i>agreeing on materials complementary to those indicated in the syllabus, supporting the implementation of tasks resulting from or necessary for class participation</i>	No
c01	Preparation for verification of learning outcomes	Determining the stages of task implementation contributing to the verification of learning outcomes <i>devising a task implementation strategy embracing the division of content, the range of activities, implementation time and/or the method(s) of obtaining the necessary materials and tools, etc.</i>	No
c02	Preparation for verification of learning outcomes	Studying the literature used in and the materials produced in class <i>exploring the studied content, inquiring, considering, assimilating, interpreting it, or organizing knowledge obtained from the literature, documentation, instructions, scenarios, etc., used in class as well as from the notes or other materials/artifacts made in class</i>	No
c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/ examination completion <i>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</i>	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 <i>reading through the academic teacher's comments, assessments and opinions on the implementation of the task aimed at checking the level of the achieved learning outcomes</i>	Yes



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 <i>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</i>	No
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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>.