

1.	Field of study	Biotechnology
2.	Faculty	Faculty of Natural Sciences
3.	Academic year of entry	2025/2026 (winter term)
4.	Level of qualifications/degree	first-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time
7.	General information about the module	
Module name		Basics of nanobiotechnology
Module code		1BT_23_47
Number of the ECTS credits		3
Language of instruction		
Purpose and description of the content of education		<p>General characteristics: nanobiotechnology is a field of nanotechnology that deals primarily with the study of existing nanostructures, enabling their use on an industrial scale, but also with the creation of new research methods in biology. Nanobiotechnology includes the use of nanomaterials in agriculture, medicine, chemical, cosmetic and food industries. Nanobiotechnology is a young science, therefore we do not always know its possibilities, but also the risks resulting from the use of nanomaterials. Therefore, the proposed subject aims to familiarize the student with the definitions used in nanobiotechnology, the advantages and disadvantages of nanobiotechnology, the impact of nanomaterials on the growth/development/functioning of living organisms.</p> <p>The aim of the course is for the student to obtain:</p> <ol style="list-style-type: none"> (1) basic knowledge in the field of nanobiotechnology, (2) the ability to analyze source materials and combine knowledge on the structure and physicochemical properties of nanomaterials with their impact on the functioning of living organisms, (3) competencies in the scope of independent development of source materials, formulating own views, discussions and expressing opinions on the impact of nanobiotechnology on human living conditions. <p>Seminars include:</p> <ol style="list-style-type: none"> 1) Introduction of basic terms, 2) classifications, production and properties of nanoparticles, 3) nanobiotechnology, nanomedicine, nanotoxicology - general information and definitions 4) review of the most important journals on the subject of "Nano" in the aspect of nanobiotechnology 5) discussion panel - nanobiotechnology in everyday life <p>The classes teach students how to work with source materials, the ability to select literature sources, participate in discussions and express their own views on the problems of nanobiotechnology. The student's own work is the current preparation for seminars. Preparation for discussion in teams and preparation for the final test.</p>
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)
K_01	Shows caution and criticism in the reception of information available in the mass media, relating to the natural sciences and achievements of biotechnology, including nanobiotechnology.	1BT_K03	4
U_01	Selects and uses the available sources of information, synthesizes the obtained data, formulates conclusions and participates in the scientific discussion on the benefits and risks of using the achievements of nanobiotechnology.	1BT_U01	4
U_02	Demonstrates the ability to work independently as well as work and communicate in a team.	1BT_U09	4
W_01	Describes, classifies and analyzes physico-chemical and biological processes occurring in nature, taking into account structures of "nano" size.	1BT_W02	4
W_02	Has basic knowledge about the benefits and risks associated with the development of nanobiotechnology.	1BT_W03	4

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>
c07	Demonstration methods	Screen presentation <i>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</i>
f02	Methods of self-learning	Individual work with a text <i>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</i>

10. Forms of teaching					
Code	Name	Number of hours	Assessment of the learning outcomes of the module	Learning outcomes of the module	Methods of conducting classes
K_01	discussion classes	30	course work	K_01, U_01, U_02, W_01, W_02	a01, c07, 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 <i>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</i>	No
a02	Preparation for classes	Literature reading / analysis of source materials <i>reading the literature indicated in the syllabus; reviewing, organizing, analyzing and selecting source materials to be used in class</i>	No

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>	Yes
c02	Preparation for verification of learning outcomes	Studying the literature used in and the materials produced in class <i>exploring the studied content, inquiring, considering, assimilating, interpreting it, or organizing 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
d02	Consulting the results of the verification of learning outcomes	Development of a corrective action plan as well as supplementary/corrective tasks <i>reviewing and selecting tasks and activities enabling the elimination of errors indicated by the academic teacher, their verification or correction resulting in completing the task with at least the minimum passing grade</i>	Yes

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