1.	**Field of study**	**Biomedical Engineering**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2024/2025 (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	**Nanomaterials in medicine**
Module code	08-IBIB-S1-17-5-NM
Number of the ECTS credits	4
Language of instruction	Polish
Purpose and description of the content of education	Moduł "Nanomateriały w medycynie" ma umożliwić studentowi orientowanie się w klasyfikacji, strukturze, defektach i właściwościach nanomateriałów stosowanych w medycynie oraz w metodach ich otrzymywania, badania i w zastosowaniach odpowiadających nowoczesnym wymaganiom medycyny. Dzięki temu student będzie mógł dobrać, materiał i metodę jego uzyskania w zależności od parametrów biometrycznych i eksploatacyjnych konkretnych elementów urządzeń, jak i uzyskać lepsze zrozumienie korelacji pomiędzy metodami otrzymywania bionanomateriałów, ich strukturą oraz właściwościami, jak i mechanizmami kształtującymi te właściwości. Dodatkowo moduł umożliwi studentom zapoznać się z szeroką gammą medycznych zastosowań nanomateriałów oraz ich zasadami działania. To z kolei pozwoli na pogłębienia umiejętności kształtowania struktury i właściwości nanomateriałów niezbędnej do różnorodnych zastosowań medycznych.
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_1	Zrozumienie założeń koncepcyjnych stosowania nanomateriałów w medycynie oraz charakterystyki ich budowy i właściwości; zrozumienie zależności pomiędzy skalą strukturalną materiałów a ich właściwościami, orientacja w bieżących trendach rozwoju nanomateriałów do zastosowań w medycynie.	W04 W07	2 2
K_2	Umiejętność oceny podstawowych cech i możliwości zastosowania nanomateriału w medycynie.	U02 U05 U24	2 3 2
K_3	Rozwój świadomości konsekwencji stosowania nanomateriałów w obszarze medycyny.	K06	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*
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*
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
k_fs_1	lecture	15	course work	K_1, K_2, K_3	a01
k_fs_2	laboratory classes	30	course work	K_1, K_2, K_3	a05, c06, 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
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
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
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	
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.