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	**Ecology for biotechnology**
Module code	1BT_23_15
Number of the ECTS credits	2
Language of instruction	
Purpose and description of the content of education	Completing this module will contribute to knowledge and competencies in ecology: ecological factors and adaptations of organisms to environmental conditions, structure and organisation of biocoenoses, biotic diversity and its determinants, ecosystem structure and functioning. Students will also acquire knowledge and competencies in combined interdisciplinary research in ecology, physiology and genetics concerning environmental stress, adaptation networks regulating the response of plants to stress (in particular related to climate change - drought and pollution - heavy metals, also due to the nature of the region - these issues are also linked to the research of the staff of the Institute of Biology, Biotechnology and Environmental Protection) from the gene and the cell to the ecosystem, as well as those stress factors standing in the way of improving crop productivity.
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	Updates expertise in ecology and can use it to interpret data appropriately and analyse the impact of human activities on the functioning of ecosystems.	1BT_K02 1BT_K03 1BT_K05	4 4 5
U_01	Explains how organisms adapt to their environment.	1BT_U01 1BT_U02 1BT_U07	3 3 3
U_02	Performs fundamental biological analyses indicating the effects of environmental conditions on organisms; - uses scientific information databases; - retrieves original publications and conducts scientific discussion based on these. Updates ecology expertise and can use this to interpret data appropriately.	1BT_U01 1BT_U02 1BT_U03 1BT_U04	4 4 5 4
W_01	Knows and understands the physiological mechanisms that enable organisms to adapt to living in altered, extreme	1BT_W01	3

	environments; - the adaptive mechanisms of organisms triggered in response to abiotic stresses and threats to civilisation.	1BT_W02 1BT_W03 1BT_W04 1BT_W13	4 4 3 3
W_02	Defines, classifies and describes interspecies interactions in nature. Lists and describes the characteristics of populations, basic principles of organisation of biocenoses, and ecosystem. Defines, lists and characterises the determinants of organisms in the environment.	1BT_W01 1BT_W02 1BT_W03 1BT_W04	4 4 4 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*
b03	Problem-solving methods	Activating method – educational games *learning content in the guise of a rule- and/or principle-based game; conducted in a deliberately arranged situation based on the description of relevant facts and processes; learners compete with one another within the framework of rules laid down by the academic teacher; varieties include simulation games – involving a simulation of real situations; decision games – based on the decision-making process and the recognition of the consequences of the decisions made (e.g., a decision tree); psychological games – increasing the emotional-volitional component of the participants' attitudes*
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*
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*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

10.	Forms of teaching				
Code	**Name**	**Number of hours**	**Assessment of the learning outcomes of the module**	**Learning outcomes of the module**	**Methods of conducting classes**
01	laboratory classes	30	course work	K_01, U_01, U_02, W_01, W_02	b02, b03, c07, d03, e01, e06, 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
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
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.