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| 1. | Field of study | Biotechnology |
| 2. | Faculty | Faculty of Natural Sciences |
| 3. | Academic year of entry | 2023/2024 (winter term), 2024/2025 (winter term) |
| 4. | Level of qualifications/degree | first-cycle studies |
| 5. | Degree profile | general academic |
| 6. | Mode of study | full-time |

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| 7. General information about the module | |
| Module name | Model organisms |
| Module code | 1BT_23_38 |
| Number of the ECTS credits | 1 |
| Language of instruction | |
| Purpose and description of the content of education | The aim of the course "Model organisms" is to characterize at various levels of organization (from morphological to molecular) organisms defined as model organisms in biological research, with particular emphasis on their use in biotechnology. Both animals will be presented (different species that are used in embryology, apoptosis, signaling and metabolic pathways, embryonic development of anamniotes, ecotoxicology and soil bioremediation); plants (cytogenetic and molecular research, mechanisms of cell/tissue differentiation regulation, metabolic activity) and microorganisms (model organisms in genetic research, structural and functional genomics, biotechnological research, including industrial biotechnology: the use of microorganisms to produce compounds useful to humans; obtaining insulin, vaccine development, etc. |
| List of modules that must be completed before starting this module (if necessary) | not applicable |

| 8. Learning outcomes of the module | | | |
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| Code | Description | Learning outcomes of the programme | Level of competenc (scale 1-5) |
| 1BT_44_1 | Student knows the characteristics of the model organism and understands its importance in various branches of biotechnology | 1BT_W05 | 4 |
| 1BT_44_2 | Student notices the physico-chemical and biological processes occurring in nature and their molecular basis | 1BT_W02 | 3 |
| 1BT_44_3 | Student notices the complex relationships that occur in nature | 1BT_W04 | 3 |
| 1BT_44_4 | Student is aware of the benefits and risks associated with the use of model organisms in biotechnology | 1BT_W08 | 3 |
| 1BT_44_5 | Student searches for the latest literature, knows how to present examples and discuss the development of research on model organisms | 1BT_U02 | 3 |
| 1BT_44_6 | When preparing for a discussion, student demonstrates the ability to work independently as well as work and communicate in a team | 1BT_U04 | 3 |
| 1BT_44_7 | Critically assesses information available in the mass media | 1BT_K01 | 3 |

| 9. Methods of conducting classes | | |
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| 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> |
| a02 | Lecture methods / expository methods | Monographic lecture <i>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</i> |
| a03 | Lecture methods / expository methods | Description <i>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</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 | | | | | |
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| Code | Name | Number of hours | Assessment of the learning outcomes of the module | Learning outcomes of the module | Methods of conducting classes |
| 1BT_44_fs_1 | discussion classes | 15 | course work | 1BT_44_1, 1BT_44_2, 1BT_44_3, 1BT_44_4, 1BT_44_5, 1BT_44_6, 1BT_44_7 | a01, a02, a03, c07, f02 |

| 11. The student's work, apart from participation in classes, includes in particular: | | | |
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| 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> | Yes |
| 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> | Yes |
| 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 |
| b01 | Consulting the curriculum and the organization of classes | Getting acquainted with the syllabus content <i>reading through the syllabus and getting acquainted with its content</i> | Yes |

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| b03 | Consulting the curriculum and the organization of classes | Consulting the schedule <i>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</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> | Yes |
| 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> | 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 <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 |

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>.