1.	Field of study	Biotechnology
2.	Faculty	Faculty of Natural Sciences
3.	Academic year of entry	2020/2021 (winter term)
4.	Level of qualifications/degree	first-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

Module: Mutagenesis

Module code: 1BT_31A

1. Number of the ECTS credits: 4

2. Learning outcomes of the module

code	description	learning outcomes of the programme	level of competence (scale 1-5)
1BT_31 _1	Presents the molecular mechanisms of physical and chemical mutagens and the generation of DNA damage with their use	1BT_W02_P 1BT_W08_P	5 5
1BT_31 _2	Defines types of mutations induced by the action of physical and chemical mutagens and explains the theoretical basis of known methods for assessing the effect of mutagens on the plant genome	1BT_W02_P 1BT_W08_P	5 5
1BT_31 _3	Characterizes the molecular mechanisms of DNA damage repair	1BT_W08_P	5
1BT_31 _4	Understands and describes the use of mutagenesis in basic research, biotechnology and plant breeding. Student knows economically important mutants and the molecular basis of their phenotype	1BT_W04_P 1BT_W05_P 1BT_W08_P	5 5 5
1BT_31 _5	Based on the experiment describes the somatic and genetic effects of mutagens and performs mutations identification in a chosen gene	1BT_W08_P	5
1BT_31 _6	Plans and performs analyzes using chromosomal aberration tests and other molecular tests, detecting DNA damage at the cytological level, interprets the results of its research with using available literature data	1BT_U01_P 1BT_U02_P 1BT_U03_P	5 5 5
1BT_31 _7	Demonstrates responsibility for own and team work; takes care of the microscopic and laboratory equipment with which he works; observes the safety rules of work in a specialized laboratory	1BT_K02_P	5
1BT_31 _8	Is aware of the need to constantly increase of knowledge and critical approach to available sources of information	1BT_K01_P 1BT_K04_P	5 5

3. Module description	
Description	The module provides basic knowledge of chemical and physical mutagens action in plant organisms. Describes the molecular mechanisms of DNA damage and their repair. Shows types of mutations caused by the action of individual mutagens and methods of their generation. It provides the student with knowledge on the applications of mutagenesis in basic research, biotechnology and practical plant breeding. The module introduces the student to methods for assessing the effect of mutagens on the structure of DNA and chromosomes. The student acquires the ability to use genetics, classical cytogenetics and molecular biology methods to determine the action of mutagens and the practical use of different tests in research in the field of plant mutagenesis.
Prerequisites	Knowledge of basic issues in the field of genetics, molecular genetics and cytogenetics. Ability to work independently with a microscope

4. Assessment of the learning outcomes of the module

code	type	description	learning outcomes of the module
1BT_31 _w_1	Coursework	according to the Syllabus	1BT_31 _1, 1BT_31 _2, 1BT_31 _3, 1BT_31 _4, 1BT_31 _5, 1BT_31 _6, 1BT_31 _7, 1BT_31 _8

5. Forms of teaching

code	form of teaching			required hours of student's own work		assessment of the learning outcomes of the module
	type	description (including teaching methods)	number of hours	description	number of hours	
1BT_31 _fs_1	lecture	The lecture illustrated with examples from own research and the latest literature, using audiovisual means computer presentations in the Power Point program illustrating the discussed processes	15	Acquiring knowledge of lectures; work with the textbook and the scientific literature	15	1BT_31 _w_1
1BT_31 _fs_2	laboratory classes	Work under the supervision of the lecturer. Possibility of consultations. Discussion of issues proposed by the student	45	Preparation for laboratory classes - learning the issues discussed during the classes and the literature recommended by the teacher	25	1BT_31 _w_1