Appendix No. 1.5 to the Resolution No. 61/2025
of the Rector of the University of Rzeszów

SYLLABUS

REGARDING THE QUALIFICATION CYCLE FROM *2026/2027* **TO** *2027/2028*

ACADEMIC YEAR *2027/2028*

1. BASIC COURSE/MODULE INFORMATION

Course/Module title	**Agrobiotechnology**
Course/Module code *	
Faculty (name of the unit offering the field of study)	Faculty of Technology and Life Sciences Institute of Agricultural Sciences, Environmental Protection, and Management
Name of the unit running the course	Department of Plant Physiology and Biotechnology
Field of study	Agriculture
Qualification level	second degree
Profile	general academic
Study mode	stationary
Year and semester of studies	year I, semester 2
Course type	major
Language of instruction	English
Coordinator	dr hab. inż., prof. UR Wojciech Litwińczuk
Course instructor	dr hab. inż., prof. UR Wojciech Litwińczuk (lectures) dr Aleksandra Siekierzyńska (laboratory classes, lectures) dr Marzena Mazurek (laboratory classes) dr Beata Jacek (laboratory classes)

* - as agreed at the faculty

1.1. Learning format – number of hours and ECTS credits

Semester (no.)	Lectures	Classes	Laboratories	Seminars	Practical classes	Internships	others	**ECTS credits**
2	13		15					2

1.2. Course delivery methods

- conducted in a traditional way

1.3. Course/Module assessment (pass with a grade)

2. PREREQUISITES

Completed courses of Plant Physiology, Genetics, Natural Science Foundations of Agriculture

3. OBJECTIVES, LEARNING OUTCOMES, COURSE CONTENT, AND INSTRUCTIONAL METHODS

3.1. Course/Module objectives

O1	Introduction of students to the field of agrobiotechnology.
O2	Providing fundamental knowledge regarding modern biotechnological processes applied in agriculture.
O3	Preparing students to use modern genetic engineering techniques of potential significance in agriculture.

3.2. COURSE/MODULE LEARNING OUTCOMES

Learning Outcome	The description of the learning outcome defined for the course/module	Relation to the degree programme outcomes
LO_01	A student knows the fundamental processes occurring at various levels of the organization of living matter.	K_W04
LO_02	A student knows about genetically modified organisms used in agriculture	K_W07
LO_03	A student can select universal, mechanical, and chemical technologies, as well as chemical technologies, for use in agriculture.	K_U04
LO_04	A student is able to analyze and select appropriate biotechnological methods for eliminating hazards in the agricultural environment.	K_U06
LO_05	A student is prepared to expand their knowledge regarding the significance of modern agriculture, the use of GMOs, and the need to learn about new biotechnological methods.	K_K03
LO_06	A student can work in a group to assess the level of risk to the agricultural environment, including risks associated with the use of GMOs.	K_U05, K_U06
LO_07	A student can independently plan and carry out the tasks specified in the practical training curriculum	K_U07

3.3. Course content

A. Lectures

Content outline
Significance and development prospects of agrobiotechnology
Specifics of the biotechnology of microorganisms, plants, and livestock.

Conventional and molecular methods of organism modification. Genetic transformation methods. NGTs as an alternative to GMOs. Bioreactors vs. molecular farming.
Molecular diagnostics in conservation and creative breeding, and monitoring of GMMs/GMOs

B. laboratories

Content outline
Familiarization with health and safety regulations, laboratory equipment, and good laboratory practice.
Methods for introducing DNA into cells: *Agrobacterium*-mediated transformation
Detection of GMOs in agricultural products. Application of PCR.
Assessment of risks resulting from the release of GMMs/GMOs into the natural environment.

3.4. Methods of Instruction

Lecture: a lecture supported by a multimedia presentation
Laboratory classes: designing and conducting experiments, discussion, group work.

4. Assessment techniques and criteria

4.1 Methods of evaluating learning outcomes

Learning outcome	Methods of assessment of learning outcomes (e.g. test, oral exam, written exam, project, report, observation during classes)	Learning format (lectures, classes…)
LO_01	test	lectures
LO_02	test	lectures
LO_03	test, experiments conducting	laboratory classes
LO_04	test, experiments conducting	laboratory classes
LO_05	observation during class laboratory	laboratory classes
LO_06	test, observation	laboratory classes
LO_07	report, experiments conducting	laboratory classes

4.2 Course assessment criteria

LABORATORY CLASSES:
The course ends with a graded pass includes: conducting laboratory experiments and presenting results, and a test.
LECTURE: test with open-ended questions.

A passing grade for the course is determined by the number of points obtained: (51%-60%) sufficient (E); 61%-70% sufficient plus (D); 71%-80%-good (C); 81%-90%-good plus (B); 91%-100% - very good (A)
To pass the course, all intended learning outcomes must be achieved.

5. Total student workload needed to achieve the intended learning outcomes – number of hours and ECTS credits

Activity	Number of hours
Course hours	28
Other contact hours involving the teacher (consultation hours, examinations)	6
Non-contact hours - student's own work (preparation for classes or examinations, projects, etc.)	20
Total number of hours	54
Total number of ECTS credits	2

* One ECTS point corresponds to 25-30 hours of total student workload

6. Internships related to the course/module

Number of hours	
Internship regulations and procedures	

7. Instructional materials

Compulsory literature: materials provided by the teacher and online resources on the topics covered
Complementary literature: online resources on the topics covered

Approved by the Head of the Department or an authorised person