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

SYLLABUS

REGARDING THE QUALIFICATION CYCLE FROM 2026/2027TO2029/2030
ACADEMIC YEAR 2027/2028

1. BASIC COURSE/MODULE INFORMATION

Course/Module title	**Breeding of Agricultural Plants and Seed Production**
Course/Module code *	
Faculty (name of the unit offering the field of study)	Faculty of Technology and Life Sciences
Name of the unit running the course	Institute of Agricultural Sciences, Environmental Protection and Management Department of Crop Production
Field of study	Agriculture
Qualification level	first-cycle studies
Profile	general academic
Study mode	stationary
Year and semester of studies	Year 2, semester 3
Course type	major
Language of instruction	English
Coordinator	Renata Tobiasz-Salach (Associate Professor)
Course instructor	Renata Tobiasz-Salach (Associate Professor) - (lectures, laboratory classes) Marzena Mazurek (PhD) (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**
3	30		30					5

1.2. Course delivery methods

X- conducted in a traditional way
- involving distance education methods and techniques

1.3. Course/Module assessment (exam, pass with a grade, pass without a grade)

Exam

2. PREREQUISITES

The student is familiar with the subject matter of the following courses: soil science, genetics, and botany.

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

3.1. Course/Module objectives

O1	Familiarizing students with the basic methods of developing crop plant cultivars.
O2	Presentation of breeding programs for self-pollinating, cross-pollinating, and vegetatively propagated plants.
O3	Familiarization with the functioning of the seed market in Poland, EU countries, and globally.

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	The student knows and understands the significance of the development of plant breeding within the natural sciences and its role in the modern world.	K_W01, K_W02, K_W09
LO_02	Knows and understands the fundamental approaches to conventional and innovative plant breeding, as well as modern methods for developing new varieties (of self-pollinating, cross-pollinating, and vegetatively propagated plants).	K_W01, K_W02, K_W09,
LO_03	Knows and understands the principles of the seed market's operation in Poland, the EU, and globally.	K_W01, K_W02, K_W09
LO_04	Is able to properly select and verify breeding methods for individual plant groups depending on the direction of breeding and the method of propagation	K_U02, K_U03, K_U04, K_U10,
LO_05	Can verify the suitability of breeding materials and their seeds for further stages of the breeding cycle	K_U02, K_U03, K_U04, K_U10
LO_06	Is ready to protect the genetic resources of plant seeds in accordance with the principles of law and ethics and is able to assess the effects of an incorrectly selected breeding method for creating a new variety	K_K01, K_K04,

3.3. Course content

A. Lectures

Content outline
Basic principles and directions of plant breeding. Biological and genetic foundations of plant breeding.

Methods modifying the range of variation of starting materials. Crossing, selection.
Presentation of breeding methods for self-pollinating, cross-pollinating, and vegetatively propagated plants.
Heterosis-based and synthetic variety breeding.
Induction of gene mutations and their use in plant breeding.
Breeding for resistance.
Conservation breeding of cultivated plants.
Biotechnological methods in creative and conservation plant breeding.
Conservation of genetic resources.
Organization and status of animal breeding in Poland.
Variety evaluation and registration. Documentation, naming, and seed industry regulations in Poland.
Rules for introducing reproductive material of new varieties of agricultural plants into the market

B. Laboratories

Content outline
Review of classical and molecular genetics concepts essential for understanding breeding issues.
Basic techniques used in plant breeding. Isolation, emasculation, pollination, and assessment of pollen viability.
Laboratory analysis of crop plant pairings. Estimated yield assessment.
Evaluation of breeding materials for economic suitability. Group work.
Analysis of the resistance of cultivars of selected crop species to abiotic stresses.
Possibilities for improving seed quality through agrotechnical and technological methods – a discussion based on the relevant literature.
Laboratory assessment of seed material.
Biotechnological methods for obtaining propagation material. Production of artificial seeds.

3.4. Methods of Instruction

Lecture: multimedia presentation.
Laboratories: group work, discussion, laboratory work involving the analysis of seed lots and sowing material, report

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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	WRITTEN EXAM WITH OPEN-ENDED QUESTIONS	LECTURE
LO-02	WRITTEN EXAM WITH OPEN-ENDED QUESTIONS	LECTURE
LO-03	WRITTEN EXAM WITH OPEN-ENDED QUESTIONS	LECTURE

LO-04	COLLOQUIUM, LABORATORY REPORT	LABORATORIES
LO-05	COLLOQUIUM, LABORATORY REPORT	LABORATORIES
LO-06	CONTINUOUS OBSERVATION	LABORATORIES

4.2 Course assessment criteria

Lecture: written exam with open-ended questions. Laboratories: graded credit; the final grade is determined based on component grades from the midterm test and the laboratory report. The condition for passing the course is to achieve all the assumed learning outcomes. A passing grade for the course is determined by the number of points obtained (>50% of the maximum score): satisfactory 51–60%, satisfactory plus 61–70%, good 71–80%, good plus 81–90%, very good 91–100%.

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

Activity	Number of hours
Course hours	60
Other contact hours involving the teacher (consultation hours, examinations)	6
Non-contact hours - student's own work (preparation for classes or examinations, projects, etc.)	60
Total number of hours	126
Total number of ECTS credits	5

* 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