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 2029/2030
ACADEMIC YEAR 2026/2027

1. BASIC COURSE/MODULE INFORMATION

Course/Module title	**Natural Fundamentals of Agriculture**
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 the Basis of Agriculture and Waste Management
Field of study	Agriculture
Qualification level	first-cycle studies
Profile	general academic
Study mode	full-time
Year and semester of studies	Year I / Semesters 1 and 2
Course type	basic subject
Language of instruction	English
Coordinator	dr hab. Mariola Garczyńska, prof. UR
Course instructor	dr hab. Mariola Garczyńska, prof. UR, dr Anna Mazur-Pączka (lectures) dr hab. Mariola Garczyńska, prof. UR, dr Anna Mazur-Pączka (classes) dr hab. Grzegorz Pączka, prof. UR (classes)

* - as agreed at the faculty

3.3. Learning format – number of hours and ECTS credits

Semester (no.)	Lectures	Classes	Laboratories	Seminars	Practical classes	Internships	Field classes	**ECTS credits**
1	15			25				4
2	15			25			5	4

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)
Semester 1**:** lectures – pass/fail; practical classes – graded pass
Semester 2: lectures – examination; practical classes – graded pass; field classes – pass

2. PREREQUISITES

Knowledge of the basic content of botany and zoology

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

3.1. Course/Module objectives

O1	Familiarizing students with the basics of botany and ecological zoology
O2	Familiarizing students with the basics of the morphology, anatomy, and reproduction of plants and animals
O3	Familiarizing students with the basics of plant adaptations to life under different environmental conditions and modifications of plant organs
O4	Presentation of the basics of the structure and functioning of the microscope, the principles of its use, and the preparation of specimens
O5	Acquisition by students of the ability to identify selected species of useful plants and animals, pests, parasites, and geohelminths.

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 concepts, phenomena, and theories in the natural and agricultural sciences necessary to explain the functioning of living organisms, with particular emphasis on cultivated and meadow plants.	K_W01
LO_02	knows and understands the possibilities of using cultivated and meadow plants from economic and environmental perspectives, as well as the relationships between plants and their environment.	K_W02
LO_03	Knows and understands measures aimed at sustainable development of rural areas and biodiversity conservation in various agricultural production systems.	K_W08
LO_04	Can plan and conduct a research experiment, interpret the results, and draw appropriate conclusions.	K_U02
LO_05	Can work in a group and properly organize individual work	K_U10
LO_06	Is ready to critically evaluate actions, taking into account environmental, social, and economic priorities.	K_K01

3.3. Course content

A. Lectures

Content outline
Semestr 1
Levels of organization of living matter. Biological sciences and the fundamentals of sustainable development
Biomes, their composition and significance
Ecology and its objectives. Research methods. Population, population characteristics, elements of the biotope
Trophic chains. Matter cycling and 3nergy flow. Homeostasis in ecosystems
Biodiversity. Primary and secondary succession. Synanthropic and misanthropic species
Selected characteristics of aquatic ecosystems and their significance for maintaining homeostasis
Ecosystem services
Semestr 2
Plant cell: structure and functions. Storage materials. Plant tissues: primary and secondary, meristematic and permanent.
Vegetative organs of plants. Morphological and anatomical structure, primary and secondary structure. Functions of organs and their practical significance. Root, shoot and stem, leaf, modifications
Generative organs of plants. Flower. Flower structure in gymnosperms and angiosperms, monocotyledons and dicotyledons. Inflorescences. Flower structure and pollination methods. Pollination and fertilization in gymnosperms and angiosperms, seed and fruit formation.
Seed and fruit. Structure and methods of dispersal. Vegetative and generative diaspores. Methods of plant dispersal. Seed germination and developmental stages of plants.
Systematic overview and significance of plants, from algae to gymnosperms

B. Laboratories, field classes

Content outline
Laboratory classes
Semestr 1
Plant and animal organisms in their natural habitats
Functioning of an animal organism using a protozoan as an example. Ecological and economic significance of protozoa
Characteristics and significance of flatworms and roundworms
Environmental role of annelids, structure and significance of molluscs.
Characteristics and significance of arthropods: crustaceans, arachnids, and insects. Insects – structure, reproduction, and significance. Overview of insect orders
General characteristics of chordates. Comparison of the structure and reproduction of fish, amphibians, and reptiles. Significance of the groups.
Comparison of the structure and reproduction of birds and mammals. Significance of the groups
Semestr 2

Microscopic observation techniques and preparation of living specimens. Characteristic features of plant cells.
Plant tissues and their functions in plants. Primary and secondary tissues; meristematic and permanent tissues
Root. Morphological and anatomical structure: primary and secondary. Types of roots, their functions and modifications.
Primary and secondary anatomical structure of the stem in seed plants. Functions of the stem and its modifications.
Leaf. Morphological and anatomical structure. Functions of the leaf and its modifications
Flower. Inflorescences and their practical identification
Seed. Seed germination. Fruit structure – practical identification
Systematic overview of plants, with emphasis on the progressive development of morphological and anatomical structures: algae, lichens, bryophytes, ferns and gymnosperms
Botanical families and plant use groups. Practical application of knowledge of the anatomical and morphological structure of plants in the identification of taxonomic units – identification of plants from selected botanical families.
Field classes
Podkarpackie Agricultural Advisory Centre – familiarization of students with the collection of cultivated plants and herbs. Principles of collecting and identifying plants in the field. Principles of herbarium preparation. Practical identification of representatives of systematic groups.

3.4. Methods of Instruction

Lecture**:** problem-based lecture, lecture with multimedia presentation

Laboratory classes**:** using macro- and microscopic specimens, charts, live specimens and herbarium materials; group work

Field classes**:** field trip involving observation of live collections and specimens of cultivated plants and herbs; brainstorming

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, written examination (two sections) with open-ended questions, report	Lectures, Laboratory classes, field classes
LO-02	Test, written examination (two sections) with open-ended questions	Lectures, Laboratory classes, field classes
LO-03	Continuous assessment and assessment of laboratory notebooks	Lectures, Laboratory classes, field classes
LO-04	Continuous assessment and assessment of laboratory notebooks	Lectures, Laboratory classes, field classes

LO-05	Continuous assessment and assessment of laboratory notebooks	Lectures, Laboratory classes, field classes
LO-06	Continuous assessment and assessment of laboratory notebooks	Lectures, Laboratory classes, field classes

4.2 Course assessment criteria

Lecture: written examination with open-ended questions (sections: zoology and botany) Laboratory classes: graded assessment Zoology and botany sections**:** assessment of laboratory notebooks and partial tests The condition for passing the course is the achievement of the intended learning outcomes. Passing the laboratory classes and fieldwork allows students to take both parts of the examination (zoology section and botany section). A positive grade for the laboratory classes is determined by the completion of the laboratory notebook and the number of points obtained in the partial tests (>50% of the maximum number of points). Fieldwork is completed upon submission of a report (pass: 51–59%; pass plus: 60–69%; good: 70–79%; good plus: 80–89%; very good: 90–100%). The positive examination grade is determined by the percentage of points obtained in the written examination (from both sections – zoology and botany): pass: 51–59%; pass plus: 60–69%; good: 70–79%; good plus: 80–89%; very good: 90–100%.

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

Activity	Number of hours
Course hours	**85**
Other contact hours involving the teacher (consultation hours, examinations)	**15**
Non-contact hours - student's own work (preparation for classes or examinations, projects, etc.)	**100**
Total number of hours	**200**
Total number of ECTS credits	**8**

* 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