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 2029/2030

1. BASIC COURSE/MODULE INFORMATION

Course/Module title	**Computer-Based Decision Support Systems**
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	full-time studies
Year and semester of studies	Year IV, Semester 7
Course type	Specialty subjects / Agronomy with Agribusiness
Language of instruction	English
Coordinator	dr hab. inż. Wacław Jarecki, prof. UR
Course instructor	dr hab. inż. Wacław Jarecki, prof. UR

* - 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**
7			15					1

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)
pass with a grade

2. PREREQUISITES

Knowledge of fundamental concepts in information technology and agricultural sciences, including the principles of agrotechnics and plant physiology.

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

3.1. Course/Module objectives

O1	Familiarizing students with the operating principles of computer-based decision support systems and their application in agriculture.
O2	Developing skills in the use of IT tools for the analysis and optimization of agricultural production processes.
O3	Preparing students to critically evaluate computer-aided decisions, taking into account environmental and sustainable development aspects.

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 OPERATING PRINCIPLES OF COMPUTER-BASED DECISION SUPPORT SYSTEMS, INCLUDING METHODS AND ALGORITHMS USED IN AGRICULTURE.	K_W05
LO_02	KNOWS AND UNDERSTANDS CONCEPTS RELATED TO AGRICULTURAL PRODUCTION MANAGEMENT AND THEIR ENVIRONMENTAL IMPACT, INCLUDING DECISION SUPPORT TECHNIQUES IN THE CONTEXT OF BIODIVERSITY CONSERVATION AND SUSTAINABLE DEVELOPMENT.	K_W08
LO_03	IS ABLE TO PLAN AND IMPLEMENT A DECISION SUPPORT SYSTEM USING APPROPRIATE COMPUTER TOOLS TO OPTIMIZE FARM OPERATIONS.	K_U01
LO_04	IS ABLE TO ANALYZE FACTORS AFFECTING THE EFFICIENCY OF CROP PRODUCTION PROCESSES, UTILIZING COMPUTER-BASED DECISION SUPPORT SYSTEMS TO IMPROVE PRODUCTIVITY AND OUTPUT.	K_U03
LO_05	IS ABLE TO USE ANALYTICAL TECHNIQUES AND COMPUTER TOOLS TO MODEL AND SIMULATE AGRICULTURAL PRODUCTION PROCESSES, OPTIMIZING NATURAL RESOURCE USE AND IMPROVING PRODUCTION QUALITY.	K_U04
LO_06	IS ABLE TO PLAN BUSINESS ACTIVITIES ACROSS VARIOUS AGRICULTURAL PRODUCTION SYSTEMS, TAKING INTO ACCOUNT THE RESULTS OF ANALYSES PROVIDED BY COMPUTER-BASED DECISION SUPPORT SYSTEMS.	K_U07
LO_07	IS ABLE TO ANALYZE AND IDENTIFY CAUSES AND ISSUES RELATED TO ENVIRONMENTAL DEGRADATION, AS WELL AS TAKE ACTION TOWARD PROPER ENVIRONMENTAL MANAGEMENT AND USE WITHIN AN AGRICULTURAL CONTEXT.	K_U09

LO_08	IS PREPARED TO CRITICALLY EVALUATE DECISIONS MADE WITHIN DECISION SUPPORT SYSTEMS, CONSIDERING ETHICAL AND ENVIRONMENTAL ASPECTS OF AGRICULTURAL ACTIVITIES.	K_K01
LO_09	IS PREPARED TO ACCEPT RESPONSIBILITY FOR DECISIONS MADE WITHIN DECISION SUPPORT SYSTEMS THAT IMPACT THE NATURAL ENVIRONMENT AND TO ACTIVELY STRIVE FOR SUSTAINABLE DEVELOPMENT.	K_K03

3.3. Course content

A. Laboratories

Content outline
Introduction to computer-based decision support systems in agriculture – definition, functions, types, and history of decision support systems.
Application of decision support systems in agricultural production management – optimization of fertilization, irrigation, and harvesting, as well as yield forecasting.
Application of decision support systems in agricultural production planning – use of systems in planning crop production processes.
Use of satellite and meteorological data in agriculture – analysis of spatial and meteorological data for predicting crop conditions.
Information technologies supporting plant health decisions – monitoring of diseases and pests, and analysis of sensor data.
Application of artificial intelligence in computer-based decision support systems.
Application of computer-based decision support systems on farms – case study: analysis of the effectiveness of decision support systems in farming operations.

3.4. Methods of Instruction

Laboratories: text analysis with discussion, project-based method, 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	COLLOQUIUM	LABORATORIES
LO-02	COLLOQUIUM	LABORATORIES
LO-03	REPORT	LABORATORIES
LO-04	REPORT	LABORATORIES
LO-05	PROJECT	LABORATORIES
LO-06	PROJECT	LABORATORIES
LO-07	REPORT	LABORATORIES
LO-08	OBSERVATION DURING CLASS	LABORATORIES
LO-09	OBSERVATION DURING CLASS	LABORATORIES

4.2 Course assessment criteria

Laboratories: course credit is awarded based on class participation, a written test, a report, and a project. The final grade takes into account the quality of engagement in discussions, the analysis of practical results, the level of mastery of theoretical knowledge, and the assessment of projects and reports. A passing grade on the written test is determined by the score achieved, exceeding 50% of the maximum possible points: Satisfactory (dst) 51–60%, Satisfactory Plus (dst plus) 61–70%, Good (db) 71–80%, Good Plus (db plus) 81–90%, and Very Good (bdb) 91–100%. The report will be evaluated based on the accuracy of the results analysis and the quality of the conclusions, while the project will be assessed based on innovation, the quality of the tools used, and the precision of execution.

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

Activity	Number of hours
Course hours	15
Other contact hours involving the teacher (consultation hours, examinations)	2
Non-contact hours - student's own work (preparation for classes or examinations, projects, etc.)	10
Total number of hours	27
Total number of ECTS credits	1

* 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