A COURSE SYLLABUS – DOCTORAL SCHOOL

REGARDING THE QUALIFICATION CYCLE FROM …2022…TO …2026….

GENERAL INFORMATION ABOUT COURSE	
Course title	**Doctoral Laboratory**
Name of the unit running the course	Doctoral School at University of Rzeszów
Type of course *(obligatory, optional)*	obligatory
Year and semester of studies	Year I - IV/Semester I-VIII
Discipline	Biological sciences
Language of Course	polish
Name of Course coordinator	dr hab. Tomasz Durak, prof. UR
Name of Course lecturer	dr hab. Tomasz Durak, prof. UR
Prerequisites	Completion of a biology course at the second degree level of studies

BRIEF DESCRIPTION OF COURSE
(100-200 words)

The doctoral workshop aims to introduce the doctoral student to independent research work, including defining the research problem and selecting research methods, as well as solving methodological problems. The main purpose of the classes carried out as part of the doctoral workshop is to prepare the doctoral student to perform the research necessary to prepare a doctoral dissertation. In particular, the doctoral student will conduct breeding experiments and laboratory tests of the collected material, followed by statistical analysis and development of the results of the research. The developed results will be confronted with the existing state of knowledge, which will provide the basis for the preparation of a doctoral dissertation. The aim of the doctoral laboratory is also to develop the ability to find and use various sources of scientific data and to educate the doctoral student's constant need to follow the literature in leading scientific journals.

COURSE LEARNING OUTCOMES AND METHODS OF EVALUATING LEARNING OUTCOMES

Learning outcome	The description of the learning outcome defined for the course	Relation to the degree programme outcomes (symbol)	Learning Format (Lectures, classes,…)	Method of assessment of learning outcomes (e.g. test, oral exam, written exam, project,…)
Knowledge (no.)	**(Knows and understands)**			
1	global achievements and directions of development, including theoretical foundations as well as general issues and selected specific issues (also in a foreign language), including those relevant to the conducted research topics in the field of biological sciences	P8S_WG1 P8S_WG3	Lab.	Project
2	directions of the latest research in the field of plant response to environmental changes	P8S_WG2	Lab.	Project
3	methodology of research applied in biological, physical, chemical and medical sciences, including applied research techniques and tools	P8S_WG4	Lab.	Project
Skills (no.)	**(Able to)**			
1	use knowledge in the field of	P8S_UW1	Lab.	Project

	biology and chemistry to identify, plan research and describe phenomena related to the physiological and biochemical reactions of plants to changes in environmental conditions and the consequences of these changes for the functioning of plant communities and the ecosystem			
2	use research literature in the field of their research, make a critical assessment of it and make their own contribution to it as a result of their research	P8S_UW2 P8S_UW3	Seminar	Project
Social competence (no.)	**(Ready to)**			
1	critical assessment of scientific achievements in the field of research on the impact of environmental changes on the functioning of plants and their consequences at the ecosystem level	P8S_KK1		

LEARNING FORMAT – NUMBER OF HOURS

Semester (no.)	Lectures	Seminars	Lab classes	Internships	others	ECTS
I - VIII			240			24

METHODS OF INSTRUCTION

laboratory, discussion, project

COURSE CONTENT

The content of the program is related to the conducted research issues
1. Operating the plant growing room
2. Principles and methods of plant breeding
3. Research techniques in the scope of the discussed research issues
4. Development of the concept, methodology and research plan
5. Growing plants in selected habitat conditions in order to collect research material
6. Analysis and development of research material
7. Gathering and reading the literature on the analyzed issues
8. Interpretation of the obtained research results and drawing conclusions
9. Preparation of the doctoral dissertation

COURSE ASSESSMENT CRITERIA

Observation and assessment of progress in the implementation of research work and the preparation of a doctoral dissertation

TOTAL PhD STUDENT WORKLOAD REQUIRED TO ACHIEVE THE INTENDED LEARNING OUTCOMES – NUMBER OF HOURS AND ECTS CREDITS

Activity	Number of hours

Scheduled course contact hours	240
Other contact hours involving the teacher (consultation hours, examinations)	60
Non-contact hours – student`s own work (preparation for classes or examinations, project, etc.)	400
Total number of hours	700
Total number of ECTS credits	24

INSTRUCTIONAL MATERIALS	
Compulsory literature:	SCIENTIFIC ARTICLES IN POLISH AND FOREIGN LANGUAGES IN THE FIELD OF PLANT PHYSIOLOGY AND ECOLOGY JAN KOPCEWICZ J., KRZYSZTOF JAWORSKI K., STANISŁAW LEWAK S., 2019. FIZJOLOGIA ROŚLIN. WYDAWNICTWO NAUKOWE PWN. LAMBERS H., CHAPIN F.S., ONS T.L. 2008. PLANT PHYSIOLOGICAL ECOLOGY. SPRINGER INTERNATIONAL PUBLISHING. WEINER J., 2028. TECHNIKA PISANIA I PREZENTOWANIA PRZYRODNICZYCH PRAC NAUKOWYCH. WYD. NAUKOWE PWN, WARSZAWA.
Complementary literature:	Pessarakli M. Ed. 1999. Handbook of Plant and Crop Stress. 2nd edn, Revised and Expanded. New York. Reigosa, MJ. 2001. Handbook of Plant Ecophysiology Techniques. Kluwer Academic Publishers, The Netherlands. Włodzimierz Meissner W., 2014. Metody statystyczne w biologii. Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk.