A COURSE SYLLABUS – DOCTORAL SCHOOL
REGARDING THE QUALIFICATION CYCLE FROM 2022 TO 2026

GENERAL ITEM INFORMATION	
Course title	**Doctoral Laboratory**
Name of the unit running the course	**Doctoral School at the University of Rzeszów**
Type of course *(obligatory, optional)*	obligatory
Year/semester of studies	I - IV / I-VIII
Discipline	Biological sciences
Language of course	Polish
Name of the course coordinator	Prof. dr hab. Andriy Sybirnyy
Name of the course lecturer	Prof. dr hab. Andriy Sybirnyy Dr hab. Justyna Ruchała, prof. UR
Prerequisites	The scope of knowledge stemming from the study programme in biological sciences, knowledge of English to the extent allowing the use of sources of scientific information, skills and competences at level 7 of the Polish Qualification Framework.

BRIEF DESCRIPTION OF COURSE
(100-200 words)

The aim of the doctoral laboratory is to:

- to prepare the doctoral student to conduct scientific work in the topic of the doctoral project being
- carried out, which is achieved by developing knowledge, skills and competences in:
- planning scientific research in the topic of the doctoral thesis being pursued by the doctoral
- student,
- conducting scientific research,
- developing research results, including with the use of statistical analyses,
- confronting own research results with literature data,
- critical analysis of the literature in the field of the doctoral dissertation,
- developing the doctoral dissertation.

LEARNING OUTCOMES FOR THE SUBJECT AND ASSESSMENT METHODS

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: Knows and understands				
EK_1	The theoretical premise of the dissertation, and understands the purpose of the topic pursued and follows the latest developments in the topic of the dissertation pursued on the production of high-value	P8S_WG1	exercise	Research project.

	substances by nonconventional yeasts.			
EK_2	Developments in the topic of the dissertation, and is able to compare his/her research results with the latest research results published in the scientific literature on lactate production.	P8S_WG2	exercise	Research project.
EK_3	Polish and English terminology used in the discipline of biological sciences and is able to use it correctly in the field of biotechnology of nonconventional yeast.	P8S_WG3	exercise	Research project.
EK_4	Tools, methods and techniques appropriate to the planned research objectives and understands the necessity of their proper selection especially in the field of yeast molecular genetics.	P8S_WG4	exercise	Research project.
Skills: Able to				
EK_5	Able to define the purpose of his/her research, as well as to formulate hypotheses and, based on the results of his/her own research and through analysis of the scientific literature, to verify them correctly. Be able to critically analyse the results of their own research, as well as evaluate them on the basis of the available scientific literature on the biotechnology of nonconventional yeasts.	P8S_UW1	exercise	Research project. Analysis of scientific literature.
EK_6	Able to demonstrate the advisability of their research in the dissertation topic and propose its implementation based on the latest literature.	P8S_UW2	seminar	Research project. Analysis of scientific literature. Preparation of manuscripts of scientific articles.

EK_7	Critically analyse the results of scientific research, expert papers and other scientific publications on the production of high-value substances in yeast	P8S_UW3	seminar	Research project. Analysis of scientific literature. Preparation of manuscripts of scientific articles.
Social competence: Ready to				
EK_8	Critically analyse and evaluate research achievements as well as scientific output .	P8S_KK1	seminar	Research project. Analysis of scientific literature. Preparation of manuscripts of scientific articles.

LEARNING FORMAT – NUMBER OF HOURS

Semester (no.)	Lectures	Seminars	Lab classes	Internships	Other	**ECTS**
I-VIII	-	-	8 x 30 hrs. – 240 hrs.	-	-	**24**

METHODS OF INSTRUCTION

- research project - performing scientific research, analysis of research results, preparation of a doctoral dissertation,
- analysis of scientific literature,
- preparation of manuscripts of scientific articles,
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COURSE CONTENT

Programme content to be implemented throughout the training cycle:

1. Principles of reliability and specificity of scientific research in the biological sciences.
2. Analysis of the available literature in the topic of the dissertation.
3. Definition of the research objective and hypotheses in the dissertation topic, including the overall research plan.
4. Development of the research concept, methodology and plan.
5. Statistical analysis of own research results.
6. Interpretation of the obtained research results based on the literature.
7. Preparation of manuscripts of scientific articles.
8. Preparation of the dissertation.

COURSE ASSESSMENT CRITERIA	
Credit with marks subjects after each semester of course implementation, applicable grading scale: 2.0, 3.0, 3.5, 4.0, 4.5, 5.0 The prerequisite for passing is observation during laboratory work, analysis of the progress of research work in the topic of the future 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 hrs. – 30 hrs. x 8**
Other contact hours involving the teacher (consultation hours, examinations)	60
Non-contact hours – student`s own work (preparation for classes or examinations, project, etc.)	420 hrs
TOTAL NUMBER OF HOURS	**720 hrs.**
TOTAL NUMBER OF ECTS CREDITS*	**24**
INSTRUCTIONAL MATERIALS	
Compulsory literature:	1. Databases of scientific publications
Complementary literature:	1. Databases of scientific publications

*(1 ECTS CREDIT CORRESPONDS TO 25 - 30 HOURS OF TOTAL WORKLOAD OF THE DOCTORAL STUDENT NEEDED TO ACHIEVE THE EXPECTED OUTCOMES)

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DATE AND SIGNATURE OF THE COURSE TUTOR

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APPROVAL OF THE HEAD OF THE UNIT OR AUTHORISED PERSON