

A COURSE SYLLABUS – DOCTORAL SCHOOL
REGARDING THE QUALIFICATION CYCLE FROM 2019 TO 2023

GENERAL INFORMATION ABOUT COURSE				
Course title	Doctoral Seminar			
Name of the unit running the course	Doctoral School at University of Rzeszów			
Type of course (<i>obligatory, optional</i>)	obligatory			
Year and semester of studies	IV/ 7, 8			
Discipline	Biological sciences			
Language of Course	Polish			
Name of Course coordinator	dr hab. Ewa Szpyrka			
Name of Course lecturer	dr hab. Ewa Szpyrka			
Prerequisites	Completed studies in biological or related sciences			
BRIEF DESCRIPTION OF COURSE (100-200 words)				
<p>The aim of the doctoral seminar is to familiarize the doctoral student with the subject of the doctoral dissertation, research methodology and improvement of measurement techniques, including advanced instrumental analysis techniques. As part of the seminar, the doctoral student will improve the skills of research planning, interpretation and critical analysis of results.</p>				
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	- To the extent enabling the revision of the existing paradigms - world achievements, covering theoretical foundations and general issues and selected specific issues: breeding of algae, ecotoxicology, environmental pollution, including pesticides, biochemical analytics - relevant to the discipline of biological sciences;	P8S-WG/1	seminar	Observation during classes, report
2	- Main trends in the development of the biological sciences discipline in which the education takes place;	P8S-WG/2	seminar	Observation during classes, report

3	- Research methodology: algae cultivation, ecotoxicological tests, biochemical analyzes, statistical calculations;	P8S-WG/3	seminar	Observation during classes, report
4	- Principles of disseminating the results of scientific activity (scientific conferences and articles), also in the open access mode;	P8S-WG/4	seminar	Observation during classes, report
5	- Basic principles of knowledge transfer to the economic and social sphere (patent applications for inventions) and commercialization of the results of scientific activity and know-how related to these results.	P8S-WK/3	seminar	Observation during classes, report
Skills (no.)	Able to:			
1	-Use knowledge from various fields of science for creative identification and innovative solving of complex problems or performing research tasks, in particular: -define the purpose and subject of research, formulate a research hypothesis, -plan laboratory experiments, develop methods, techniques and research tools and use them creatively, -make conclusions on the basis of scientific research;	P8S-UW/1	seminar, practical classes	Observation during classes, report
2	- Make a critical analysis and evaluation of the results of scientific research, methodology of conducting of ecotoxicology test, expert activities and other creative works and their contribution to the development of knowledge;	P8S-UW/2	seminars, practical classes	Observation during classes, report
3	- Transfer the results of scientific activity to the economic and social sphere;	P8S-UW/3	seminar	Observation during classes, report
4	- Communicate on specialist topics to the extent that allows active participation in the international scientific community;	P8S-UK/1	seminars, practical classes	Observation during classes, report

5	- Disseminate the results of scientific activity, also in popular forms;	P8S-UK/2	seminars, practical classes	Observation during classes, report
6	- Initiate a debate;	P8S-UK/3	seminars	Observation during classes
7	- Participate in the scientific discourse;	P8S-UK/4	seminars	Observation during classes
8	- Plan and implement individual and team research projects, also in an international community;	P8S-UO	seminars	Observation during classes, report
9	- Independently plan and act for one's own development as well as inspire and organize the development of other people;	P8S-UU/1	seminars	Observation during classes, report
Social competence (no.)	Ready to:			
1	- Critically assess achievements in biological sciences;	P8S-KK/1	seminars	Observation during classes, report
2	- Critically evaluate own contribution to the development of biological sciences;	P8S-KK/2	seminars	Observation during classes, report
3	- Recognize the importance of knowledge in solving cognitive and practical problems;	P8S-KK/3	seminars	Observation during classes, report
4	- Maintain and develop the ethos of research and creative communities, including: - independently conducting research activities, - respecting the principle of public ownership of the results of scientific activity, taking into account the principles of intellectual property protection	P8S-KR	seminars	Observation during classes, report
LEARNING FORMAT – NUMBER OF HOURS				

Semester (no.)	Lectures	Seminars	Lab classes	Internships	others	ECTS
7	-	v	-	-	-	
8	-	v	-	-	-	
METHODS OF INSTRUCTION						
Scientific discussion, lecture, practical laboratory classes.						
COURSE CONTENT						
Environmental toxicology and ecotoxicology. - Conducting ecotoxicological tests. - Biochemical analyzes. - Gas chromatography coupled with mass spectrometry. - Analysis of the results. - Principles of disseminating research results.						
COURSE ASSESSMENT CRITERIA						
The doctoral student is obliged to carry out the planned laboratory tests, analyze the results and present a draft version of the dissertation chapters.						
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			30 hours / semester			
Other contact hours involving the teacher (consultation hours, examinations)			30 hours / semester			
Non-contact hours – student`s own work (preparation for classes or examinations, project, etc.)			20 hours / semester			
Total number of hours			80 hours / semester			
Total number of ECTS credits			0			
INSTRUCTIONAL MATERIALS						
Compulsory literature:	- Walker C.H., Hopkin S.P., Sibly R.M., Peakall D.B.: Podstawy ekotoksykologii. Wydawnictwo Naukowe PWN, Warszawa 2002. - Manahan S.E.: Toksykologia środowiska. Aspekty chemiczne i biochemiczne. Wydawnictwo Naukowe PWN, Warszawa 2012. - Szczepaniak W.: Metody instrumentalne w analizie chemicznej. Wydawnictwo Naukowe PWN, Warszawa 2012.					
Complementary literature:	- Scientific journals in Polish and in a foreign language in the field of biological sciences.					

.....
Date and signature of the Course lecturer

.....
Approved by the Head of the Department or an authorised person