

**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 the University of Rzeszów			
Type of course ( <i>obligatory, optional</i> )	Obligatory			
Year and semester of studies	semesters I - VIII			
Discipline	food and nutrition technology			
Language of Course	Polish			
Name of Course coordinator	prof. dr hab. Izabela Sadowska-Bartosz			
Name of Course lecturer	prof. dr hab. Izabela Sadowska-Bartosz			
Prerequisites	Knowledge of food biochemistry, biophysics, food technology food.			
BRIEF DESCRIPTION OF COURSE (100-200 words)				
<p>The doctoral dissertation is designed to prepare the doctoral student (under the substantive supervision of the supervisor) to conduct scientific research independently. Moreover, it should also prepare the doctoral student to formulate research hypotheses, optimize research methodology, perceive and verbalize scientific problems. The specific goal is: to perform laboratory research as part of the completion of the doctorate, statistical analysis and elaboration of the results of this research. The goal of the doctoral laboratory is also:</p> <ul style="list-style-type: none"><li>- to expand knowledge of methods of acquiring scientific information and preparing and writing a scientific paper with respect for copyright and intellectual property,</li><li>- to draw the attention of the doctoral student to the need for further education and systematic familiarization with the current scientific literature.</li></ul>				
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 that it is possible to revise existing paradigms, it is familiar with the global scientific achievements, including theoretical foundations and general issues and selected specific issues - relevant to the scientific discipline of food and nutrition technology and related disciplines.	P8S_WG1	Laboratories	project /implementation of research plan
2	The main development trends in the leading discipline of food and nutrition technology and related disciplines, as well as the latest discoveries in the scientific discipline in which the training takes place.	P8S_WG2	Laboratories	project /implementation of research plan
3	Knows and understands the nomenclature used in the scientific discipline of food	P8S_WG3	Laboratories	project /implementation of research plan

	technology and nutrition and related disciplines in Polish and in the foreign language leading for them.			
4	He knows the methodology, principles of planning scientific research and its implementation, in his research applies interdisciplinary research methods, tools and techniques.	P8S_WG4	Laboratories	project /implementation of research plan
<b>Skills (no.)</b>	<b>(Able to)</b>			
1	Use interdisciplinary knowledge to creatively identify and innovatively solve complex problems or perform tasks of a research nature, and in particular: - is able to define the purpose and object of scientific research, formulate a research hypothesis, - develop methods, techniques and research tools and creatively apply them, can make conclusions based on the results of scientific research.	P8S_UW1	Laboratories	project /implementation of research plan
2	Use national and world scientific literature to diagnose and solve the resulting research problems. Be able to use the acquired knowledge to solve innovative research problems and also to create their own workshop and scientific output.	P8S_UW2	Laboratories	project /implementation of research plan
3	Perform critical analysis and Evaluate the results of scientific research, expert activities expert and other works of creative nature and determine their contribution to the development of knowledge.	P8S_UW3	Laboratories	project /implementation of research plan
<b>Social competence (no.)</b>	<b>(Ready to)</b>			
1	Critically evaluate achievements in the scientific discipline of food technology and nutrition and related disciplines.	P8S_KK1	Laboratories	project /implementation of research plan

#### LEARNING FORMAT – NUMBER OF HOURS

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

METHODS OF INSTRUCTION	
<p>Discussion, solving research problems, laboratory work, analysis and presentation of research results, Analysis and interpretation of professional scientific literature.</p> <p>Discussion with the supervisor on good manners in science; methodology for preparing a dissertation in food technology and nutrition, work plan and methods of its implementation and respect for copyright; interpretation of results (30 semester hours).</p>	
COURSE CONTENT	
<p>The program content is closely related to the area of research work of the doctoral student, implemented through the educational cycle (semester I to VIII).</p> <ol style="list-style-type: none"> <li>1. Principles of operation of the research laboratory.</li> <li>2. Specifics of scientific work, research techniques in the field of the selected specialty.</li> <li>3. Development of the concept and plan of work, determination of the purpose and methods of research.</li> <li>4. Obtaining food products/dietary supplements, performing scientific research appropriate to the the selected research problem.</li> <li>5. Development and interpretation of research results. Formulation of conclusions.</li> <li>6. Searching for scientific literature in the field of the research problem presented in the dissertation.</li> <li>7. Editing manuscripts with respect for the intellectual property of the authors of the scientific literature used.</li> </ol>	
COURSE ASSESSMENT CRITERIA	
<p>Observation during laboratory work, discussion, analysis of the progress of research carried out in connection with the dissertation being prepared.</p> <p>Credit with a grade after each semester of course implementation, the applicable grading scale is: 2.0, 3.0, 3.5, 4.0, 4.5, 5.0.</p>	
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 /8 semester – 30 hrs.
Other contact hours involving the teacher (consultation hours, examinations)	240 /8 semester – 30 hrs.
Non-contact hours – student's own work (preparation for classes or examinations, project, etc.)	240 /8 semester – 30 hrs.
<b>Total number of hours</b>	720 hrs.
<b>Total number of ECTS credits*</b>	24
INSTRUCTIONAL MATERIALS	
Compulsory literature:	<p>- Food Oxidants and Antioxidants: Chemical Biological and Functional Properties. Edited by G. Bartosz. Taylor &amp; Francis Group, 2016</p> <p>- January Weiner: Techniques for writing and presenting natural science papers. PWN Scientific Publishers, 2018</p> <p>- Seals DR, Tanaka H. Manuscript peer review: a helpful checklist for students and novice referees. Adv Physiol Educ. 2000 Jun; 23(1):52-8. PubMed PMID: 10902527</p>

	- Blackwell, J. 2011. A Scientific Approach to Scientific Writing, Springer, New York [electronic resource]. Unpublished materials - protocols by the supervisor.
Complementary literature:	Scientific journals in Polish and foreign language in the field of food technology and human nutrition, food analysis and biotechnology. Detailed literature in the field of the realized doctoral thesis.

\*(1 ECTS CREDIT CORRESPONDS TO 25 - 30 HOURS OF THE TOTAL WORKLOAD OF A DOCTORAL STUDENT, NEEDED TO ACHIEVE THE ESTABLISHED EFFECTS).

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 Date and signature of the Course lecturer

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 Approved by the Head of the Department or an authorised person