

**TRAINING PROGRAMME AT THE DOCTORAL COLLEGE OF BIOLOGICAL SCIENCES
OF THE DOCTORAL SCHOOL OF THE UNIVERSITY OF WROCLAW**
in scientific discipline - biological sciences

Training Programme at the Doctoral College of Biological Sciences of the Doctoral School of the University of Wrocław in scientific discipline - biological sciences										
	ECTS	Exam/Credit	number of hours	lecture	tutorial	seminar	class	laboratory	workshop	
YEAR 1										
HEALTH AND SAFETY	-	Credit		e-learning classes						
University-wide classes (Credit) Obligatory subjects: obtaining sources of financing scientific research, legal basis of scientific activity, copyright in scientific works, ethics of scientific research and other (additionally realised)		Exam/Credit	32							
Higher education didactics ¹	2	Credit	30		30					
Work placement*		Credit	min. 10 max. 60							
Elective classes offered in the Doctoral College of Biological Sciences (ZK)	depending on the selection	Exam/Credit	30							
YEAR 2										
New in biological sciences I	3	Credit	30		30					
New in biological sciences II	3	Credit	30		30					
Work placement*		Credit	min. 10 max. 60							
YEAR 3										

New in biological sciences III	3	Credit	30		30				
New in biological sciences IV	3	Credit	30		30				
Work placement*		Credit	min. 10 max. 60						
YEAR 4									
Work placement*	1	Credit	min. 10 max. 60						
Popularisation of science**/**	-	Credit	min. 10				10		
Preparation of the doctoral thesis ***	20	Credit	bw						
Total min.	39****		262						
In addition, it is mandatory to:									
conduct research, reporting the results at least once a year and publishing the results									
provide on-call consultancy services for students in connection with work placements									
participate in scientific conferences (national and international) or other scientific events, e.g. lectures by visiting professors									
participate in seminars, symposia, congresses, etc. organised in the faculties									
take part in: organisational activities, works of departmental teams, works of the Faculty Council or Doctoral Student Council									
submit a doctoral thesis									

Elective courses offered in the Doctoral College in Biological Science	ECTS	Exam/Credit	number of hours	lecture	tutorial	seminar	class	laboratory	workshop
Statistical methods of data analysis	3	Exam	30	5				25	
Bioinformatics				10				20	
GIS in practice				5				25	
Phylogenetics				15				15	

Peer review workshops	4	Credit	30							30
Anthropogenic climate change and its consequences for living organisms	2	Credit	15	10	5					
Metagenomics	2	Credit	15	15						
The use of fluorescence in biology and biotechnology										
Genetic engineering of bioproducts										
Practical data analysis										
The birth of the cell - molecular mechanisms of organelle biogenesis - the researcher's point of view										
The birth of the cell - molecular mechanisms of organelle biogenesis - researcher's point of view										
Novel methods to study cells and biomolecules interactions										
or courses offered by other Colleges										
Lectures by visiting professors in Polish or English	depending on the number of hours	Credit								

1) or another course which implements learning outcomes related to the transfer of knowledge for different target groups

*Work placement - one full credit upon completion of training in the Doctoral School

**popularisation of science is realised during the whole period of education through participation in events such as the Science Festival, the Night of Biologists, etc.

- one full credit upon completion of training at the Doctoral School on the basis of certificates

*** One full credit upon completion of training in the Doctoral School

****plus ECTS for elective lectures

**LEARNING OUTCOMES SPECIFIED IN THE DOCTORAL COLLEGE OF BIOLOGICAL SCIENCES
OF THE DOCTORAL SCHOOL OF THE UNIVERSITY OF WROCLAW IN THE SECOND-CYCLE CHARACTERISTICS OF
THE POLISH QUALIFICATIONS FRAMEWORK**

Descriptive category level 8	Descripti on compon ent code	Specification	Specification effects code
		KNOWLEDGE: doctoral students knows and understands	
scope and comprehensiveness cognitive perspective and dependencies	P8S_WG	<p>knows and understands, to the extent that the revision of existing paradigms is possible, the global acquis, covering theoretical foundations and general and selected specific issues, appropriate to the biological sciences,</p> <ul style="list-style-type: none"> - perceives interdisciplinarity and multidisciplinary of research problems, taking into account current ethical dilemmas in conducting scientific research; - is familiar with current issues in the biological sciences based on publications in leading scientific journals; - demonstrates detailed knowledge of his/her subject matter (at the level of recent publications in specialised world journals and also of as yet unpublished reports from scientific conferences); - has knowledge of modelling natural phenomena and processes and of the principles of methodology of biological sciences 	<p>SD_W01</p> <p>SD_W02</p> <p>SD_W03</p> <p>SD_W04</p>
		<p>the main trends in the development of the biological sciences, and in particular</p> <ul style="list-style-type: none"> - is familiar with current issues in the biological sciences based on publications in leading scientific journals; - demonstrates detailed knowledge of his/her subject matter (at the level of recent publications in specialised world journals and also of as yet unpublished reports from scientific conferences); - demonstrate an advanced knowledge of biological sciences-specific vocabulary in the mother tongue and in at least one other foreign language (English) 	<p>SD_W02</p> <p>SD_W03</p> <p>SD_W07</p>

		<p>research methodology, the principles for dissemination of scientific activity, and in particular:</p> <ul style="list-style-type: none"> - has knowledge of modelling natural phenomena and processes and of the principles of methodology of biological sciences; - knows the specialised research and teaching techniques used in the biological sciences; - knows the principles of transferring academic knowledge to different groups of target people 	<p>SD_W04</p> <p>SD_W05</p> <p>SD_W08</p>
context - determinants, effects	P8S_WK	<p>the fundamental dilemmas of modern civilisation;</p> <ul style="list-style-type: none"> - perceives interdisciplinarity and multidisciplinary of research problems, taking into account current ethical dilemmas in conducting scientific research; 	SD_W01
		<p>economic, legal and other relevant determinants of scientific activity;</p> <ul style="list-style-type: none"> - knows the organisation of science, principles of creating research projects and forms of obtaining funds for science and their implications for practice 	SD_W06
		<p>the principles of knowledge transfer to the economic and social spheres and of the commercialisation of the research results of scientific activities and of the know-how related to these results, in particular:</p> <ul style="list-style-type: none"> - knows the principles of communicating scientific knowledge in an understandable way at a popular and basic academic level, in the mother tongue and in a foreign modern language (English); - knows the principles of preparation for printing and publication of scientific articles, in the mother tongue and in a foreign modern language (English) with a view to their potential practical use; - knows the principles of transferring academic knowledge to different groups of target people 	<p>SD_U06</p> <p>SD_U07</p> <p>SD_W08</p>

		SKILLS: doctoral student is able to	
use of knowledge – problem-solving and activities performed	P8S_UW	<p>use knowledge from different fields of science to creatively identify, formulate and innovatively solve complex problems or perform research tasks: define the aim and subject of research, formulate a research hypothesis, develop research methods, techniques and tools and apply them creatively, make conclusions on the basis of research results, in particular:</p> <ul style="list-style-type: none"> - independently uses modern research techniques, adapting them to his/her own research and needs; - use his/her mother tongue and a modern foreign language (English) to a degree which enables you to communicate freely, including writing articles and presenting papers; - prepares and carries out research projects that serve his/her own development and inspire the development of others - applies and improves methods of data analysis and reasoning to an advanced degree; - knows the principles of preparation for printing and publication of scientific articles, in the mother tongue and in a foreign modern language (English) with a view to their potential practical use; - apply health and safety rules 	<p>SD_U01</p> <p>SD_U02</p> <p>SD_U03</p> <p>SD_U04</p> <p>SD_U07</p> <p>SD_U08</p>
		<ul style="list-style-type: none"> - demonstrates a detailed knowledge of his/her subject area (up-to-date publications in peer-reviewed journals and unpublished reports from scientific conferences) 	SD_W03
		<p>critically analyse and evaluate research results, in particular:</p> <ul style="list-style-type: none"> - critically appraises research results in the biological sciences contained in scientific publications and research projects and presented at scientific conferences; - properly evaluates the results of its expert activities; - is able to evaluate the contribution of research results to the development of biological sciences 	SD_U05

		<p>transfer research results to the economic and social spheres, in particular:</p> <ul style="list-style-type: none"> - knows the principles of communicating scientific knowledge in an understandable way at a popular and basic academic level, in the mother tongue and in a foreign modern language (English); - knows the principles of preparation for printing and publication of scientific articles, in the mother tongue and in a foreign modern language (English) with a view to their potential practical use; - is able to transfer academic knowledge to the needs of lower-level education and the social environment 	<p>SD_U06</p> <p>SD_U07</p> <p>SD_W08</p>
<p>communication - receiving and producing statements, disseminating knowledge in the scientific community and using a foreign language</p>	<p>P8S_UK</p>	<p>communicate on specialised topics to the extent necessary to take an active part in the international scientific community, in particular:</p> <ul style="list-style-type: none"> - knows the principles of communicating scientific knowledge in an understandable way at a academic level, in the mother tongue and in a foreign modern language (English); - prepares for publication and publishes scientific articles, in the mother tongue and in a foreign modern language; (English) with a view to their potential practical use 	<p>SD_U06</p> <p>SD_U07</p>
		<p>disseminate the results of scientific activities also in popular forms, in particular:</p> <ul style="list-style-type: none"> - communicates scientific knowledge (lectures, papers) in an understandable way at a popular level in the mother tongue and in a modern foreign language (English); - knows the principles of transferring academic knowledge to different groups of target people 	<p>SD_U06</p> <p>SD_W08</p>
		<p>participate in scientific discourse, in particular:</p> <ul style="list-style-type: none"> - critically appraises research results in the biological sciences contained in scientific publications and research projects and presented at scientific conferences; - is able to evaluate the contribution of research results to the development of biological sciences 	<p>SD_U05</p> <p>SD_U06</p>

		- communicates scientific knowledge (lectures, papers) in an understandable way at an academic level, in the mother tongue and in a modern foreign language (English)	
		use a foreign language at B2 level of the Common European Framework of Reference for Languages to the extent necessary to participate in an international scientific and professional environment, in particular - use his/her mother tongue and a modern foreign language (English) to a degree which enables you to communicate freely, including writing articles and presenting papers;	SD_U02
work organisation - planning and teamwork	P8S_UO	can plan and carry out an individual and groups research , in particular: project, including in an international environment. - prepare and carry out research projects that serve his/her own development and inspire the development of others - applies and improves methods of data analysis and reasoning to an advanced degree;	SD_U03
learning - planning student's own development and the development of others	P8S_UU	independently plan and act for one's own development and inspire and organise the development of others; - prepare and carry out research projects in the biological sciences for his/her own development and to inspire the development of others;	SD_U03
		- knows the principles of communicating scientific knowledge in an understandable way at a popular and basic academic level, in the mother tongue and in a foreign modern language (English); can plan a class or group of classes and deliver them using modern methods and tools, in particular: - analyses the current state of legislation in the field of education in terms of the quality of education and the development of educational programmes, develops a project of original classes within the framework of the implemented study or training programmes;	SD_U06 SD_U09 SD_U08

		- is able to transfer academic knowledge to the needs of student education	
		SOCIAL COMPETENCE: doctoral student is willing to	
evaluations - a critical approach	P8S_KK	critically appraise the output of biological sciences, in particular: - critically appraises research results in the biological sciences contained in scientific publications and research projects and presented at scientific conferences; - is able to evaluate the contribution of research results to the development of biological sciences	SD_U05
		critically appraise his/her own contribution to the development of the biological sciences, and in particular is capable of self-critical evaluation in creative and teaching work	SD_K02
		recognise the importance of knowledge in solving cognitive and practical problems, and in particular is aware of the need for constant updating of knowledge and further training	SD_K06
	P8S_KO	fulfilling the social obligations of researchers and creators, in particular: - takes responsibility for safety at work, organises safe working conditions	
responsibility - fulfilling social obligations and acting in the public interest		- apply the code of ethical and legal principles in research and teaching	SD_K03, SD_K04
		initiating actions in the public interest, in particular: - taking responsibility for his/her own work and of others; - is able to work in a team, open to discussion and cooperation	SD_K01, SD_K05
		recognise the importance of knowledge in solving cognitive and practical problems, and in particular is aware of the need for constant updating of knowledge and further training	SD_K06
professional role -independence and ethos development	P8S_KR	uphold and develop the ethos of the research community, including the conduct of research in an independent manner, and respect the principle of public ownership of research results including the principles for the protection of intellectual property, in particular: - apply the code of ethical and legal principles in research and teaching	SD_K04