

Programme of PhD studies

General characteristics of the PhD studies	
The institution conducting PhD studies:	Faculty of Biology and Environmental Protection
Name of the PhD studies:	Advanced methods in biotechnology and biodiversity
Name of the PhD studies in English:	Advanced methods in biotechnology and biodiversity
Location of study: <ul style="list-style-type: none">• Field of science:• Branch of science/art:• Scientific/art discipline:	Natural science Biological science Biology, biotechnology, environmental protection
Form of studies (<i>full-time/extramural</i>)	Full-time
Total number of ECTS credits:	45

The expected learning outcomes for PhD studies in natural science, branch of science: biological sciences

L. p.	Competence of the graduate from the PhD studies in natural sciences, branch of science: biological sciences
Knowledge	
AM_W-1	Possesses an advanced knowledge in the leading field of science connected with the performed research area, including the recent scientific discoveries
AM-W-2	Possesses an advanced knowledge in the area of performed research, covering the recent scientific discoveries
AM-W-3	Explains the scientific value of the reports published in scientific journals from the discipline of science
AM_W-4	Possesses the knowledge in methodology of teaching and modern techniques of efficient didactic processes
Skills	
AM_U-1	Is able to plan and realize their own scientific project as well as to conduct their scientific activity in a larger team of researchers
AM_U-2	Formulates scientific hypotheses and verifies them by means of statistical methods
AM_U-3	Uses sophisticated mother tongue as well as congressional language (English) so that he/she is able to write scientific manuscripts, present posters and give short lectures
AM_U-4	Is able to obtain financial support for scientific research and knows the rules of how to create research projects
AM_U-5	Possesses teaching skills at the academic level and is able to apply modern methods and techniques of teaching
Social competences	
AM_KS-1	Demonstrates self-criticism in creative work, understands and feels the need to complete the knowledge and to increase the personal and professional competences and, especially, to follow and analyze the recent discoveries connected with the discipline of studies
AM_KS-2	Describes ethical aspects of researcher's interference into an organism, set of organisms or their environment
AM_KS-3	Critically assesses the results of the scientific research, both of his/her own and of the others.
AM-KS-4	Works in a team as a co-investigator or principal investigator and esteems the work and experience of the co-workers
AM_KS-5	Follows the rules of ethics in scientific work and obeys the rules of good practice in the professional work.

Obligatory and facultative (F) training modules and their expected learning outcomes.			
Training module	Number of ECTS credits	Expected learning outcomes	Verification methods of the learning outcomes achieved by a PhD student
Advanced methods in animal biodiversity (research) - F	2	(AM_W-2); (AM_W-3); (AM_U-2) (AM_U-3); (AM_KS-1); (AM_KS-3)	report
Advanced methods in plant ecophysiological research - F	2	AM_W-1; AM_W-2; AM_W-3; AM_U-3; AM_U-2; AM_KS-3; AM_KS-4	current assessment of practical skills and activity report
Advanced molecular cytogenetics - F	3	AM-W-2, AM_U-1, AM_U-3, AM_KS-1, AM_KS-3, AM-KS-4, AM_KS-5	current assessment of practical skills and activity report
Advanced statistical methods in natural sciences - F	3	AM_U-1; AM_U-3; AM_W-2;AM_KS-1; AM_W-1; AM_U-2;AM_W-2; AM_W-3; AM_KS-3	written test
Analytical scanning electron microscopy in biological and environmental researches - F	3	AM-W-2, AM_U-1, AM_U-3, AM_KS-1, AM_KS-3, AM-KS-4, AM_KS-5	current assessment of practical skills and activity report
Arthropods diversity and conservation - F	3	AM_W-1. AM_W-2 AM_W-4. AM_U-1 AM_KS-1	final presentation
Biomarkers in monitoring exposure and effects of xenobiotics in the environment - F	3	AM_W-1; AM_W-4; AM_U-1; AM_U-2; AM-KS-2; AM-KS-3; AM-KS-4	current assessment of practical skills and activity report
Biophysical aspects of plant growth and development - F	3	AM_W-2; AM_W-3; AM_U-1 AM_KS-1; AM_KS-5	report
Chromatin immunostaining methods - F	3	AM-W-2, AM_U-1, AM_U-3, AM_KS-1, AM_KS-5	current assessment of practical skills and activity report

Contemporary methods in monitoring the history of contamination of the natural environment. - F	2	AM_W-1; AM_W-2; AM_W-3; AM_U-1; AM_U-3; AM_KS-1; AM_KS-3; AM_KS-5__	current assessment of practical skills and activity report
Cyto- and histochemical analysis of embryonic animal tissues - F	3	AM_W-1; AM_W-4;AM_U-5;AM_KS-5	current assessment of practical skills report
Effective presentation workshop	2	AM_W-4 ; AM_U-5; AM_U-3	current assessment of practical skills and activity final presentation
Philosophy	1	AM_KS-2; AM_KS-3	exam
English classes	1	AM_W-2; AM_U-3	exam
Microorganisms in the environment and their use in biotechnology - F	3	AM_W-2; AM_W-3; AM_W-4 AM_U-2; AM_U-3 AM_KS-3; AM_KS-4; AM_KS-5	current assessment of practical skills and activity report
Modern methods in teaching of biology	3	AM_W-4 ; AM_U-5; AM_U-3	current assessment of practical skills and activity final presentation
Molecular methods in plant and animal biodiversity research - F	2	(AM_W-2);(AM_U-2);(AM_U-3);(AM_KS-3) (AM_KS-4)	report
Patch clamp studies in plant cell - F	3	(AM_W-1, AM_W-4); (AM_U-1, AM-U-5, AM-KS-1, AM_KS-3).	current assessment of practical skills and activity report written test
Plant functional genomics - F	3	AM_W-2; AM_W-3; AM_U-2; AM_KS-1; AM_KS-3	report written test
Plant invasion: species biology, ecological threat and ecosystem management - F	2	AM_W-1; AM_W-3 AM_U-1; AM_U-3; AM_KS-3	current assessment of practical skills and activity report

Plant morphogenesis in vivo and in vitro - F	3	AM_W-1; AM_W-2; AM_W-3 AM_U-1; AM_U-2; AM_U-3 AM_KS-1; AM_KS-3; AM_KS-4; AM_KS-5	current assessment of practical skills and activity report written test
Population and succession studies of Central European lowland ecosystems. - F	3	AM_W-1; AM_W-2; AM_W-3; AM_U-1; AM_U-3; AM_KS-1; AM_KS-3; AM_KS-5	current assessment of practical skills and activity final presentation
Practical bioinformatics - F	2	AM_W-1; AM_W-2; AM_W-3 AM_U-1; AM_U-2; AM_U-3 AM_KS-1; AM_KS-3; AM_KS-4; AM_KS-5	current assessment of practical skills and activity report
Apprenticeship	16	AM_W-3; AM_W-4 AM_U-5 AM_KS-2; AM_KS-5	classroom observation evaluated by a tutor / supervisor
Preparation of an application for a research project or participation in an external project as an investigator.	2	AM_W-2; AM_W-3; AM_U-1; AM_U-4 AM_KS-3; AM_KS-4; AM_KS-5	application evaluated by a tutor / supervisor
Specialisation seminar	8	AM_W-1; AM_W-2; AM_W-3; AM_U-2; AM_U-3 AM_KS-1; AM_KS-2; AM_KS-3; AM_KS-4	final presentation current assessment of practical skills and activity
I faculty seminar (PhD report session) (research plan; preliminary results) (in English)	1	AM_W-1; AM_W-3; AM_U-1; AM_U-3 AM_KS-1; AM_KS-2; AM_KS-3	POSTER evaluated by the Programme Council of PhD Studies
II faculty seminar (PhD report session) (presentation of hitherto results) (in English)	1	AM_W-2; AM_W-3; AM_U-2; AM_U-3 AM_KS-1; AM_KS-2; AM_KS-3; AM_KS-4	PRESENTATION evaluated by the Programme Council of PhD Studies
III faculty seminar (PhD report session) (presentation of the results included in PhD dissertation) (in English)	2	AM_W-2; AM_W-3; AM_U-1; AM_U-2; AM_U-3 AM_KS-1; AM_KS-2; AM_KS-3; AM_KS-4; AM_KS-5	PRESENTATION evaluated by the Programme Council of PhD Studies

Techniques for biodiversity of soil microorganisms - F	2	AM_W-2; AM_W-3; AM_W-4 AM_U-2; AM_U-3 AM_KS-3; AM_KS-4; AM_KS-5	current assessment of practical skills and activity report
The design of field, cultivation and controlled environment experiments in ecology – introduction - F	2	AM_W-1; AM_W-2; AM_W-3 AM_U-1; AM_U-3; AM_KS-3	report final presentation
Theoretical framework of forest restoration - F	3	AM_W-1; AM_W-2 AM_W-3; AM_U-1; AM_U-3; AM_KS-2	Final presentation
Other requirements			
<i>Laboratory on research project</i>	-		<i>Annual report</i>
<i>Preparation of PhD thesis</i>	-		<i>Appointment of the reviewers</i>

The programme is in force beginning with 2014/2015 academic year

The programme of PhD studies was accepted by the Faculty Council of the Faculty of Biology and Environmental Protection on
(name of faculty)

4.07.2014
(date)

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Framework plan of PhD studies

The institution conducting PhD studies:	Faculty of Biology and Environmental Protection
Name of PhD studies	Advanced methods in biotechnology and biodiversity
Form of studies (<i>full-time/extramural</i>)	Full-time
Total number of ECTS credits	45

Year I

Obligatory courses					
Code of the module in USOS	Module name	Form of activities	Evaluation method	Number of contact hours	Number of ECTS credits
	Specialisation seminar	Seminar	mark	15	2
	I faculty seminar – poster session	Seminar	mark	15	1
	Apprenticeship	Laboratory	mark	90	4
	Other requirements Laboratory on research project	Laboartory	mark	-	-
Total				120	7
Facultative courses					
	Effective presentation workshop	Laboratory	mark	15	2
	Modern methods in teaching of biology	Laboartory	mark	30	3
	Facultative courses	Lecture/seminar/ laboratory	mark	Completed within 4-years cycle	
Total:				45 + Facult. courses.	5+ Facult. Courses
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Total: obligatory and facultative courses:				165 + Facult. courses	12 + Facult. courses

Year II

Obligatory courses					
Code of the module in USOS	Module name	Form of activities	Evaluation method	Number of contact hours	Number of ECTS credits
	Specialisation seminar	seminar	mark	15	2
	II faculty seminar – oral presentation	seminar	mark	15	1
	Apprenticeship	Laboratory	mark	90	4
	Other requirements Laboratory on research project	Laboratory	mark	-	-
Total				120	7
Facultative courses					
	Facultative courses	Lecture/seminar/ laboratory	mark	Completed within 4-years cycle	
Total:				Facult. courses	Facult. courses
Total: obligatory and facultative courses:				120 + Facult. courses	7 + Facult. courses

Year III

Zajęcia obowiązkowe					
Code of the module in USOS	Module name	Form of activities	Evaluation method	Number of contact hours	Number of ECTS credits
	Specialisation seminar	seminar	mark	15	2
	Preparation of an application for research project or participation in other project	Consultation	mark	30	2
	Apprenticeship	Laboratory	mark	90	4
	Other requirements Laboratory on research project	Laboratory	mark	-	-
Total				135	8

Facultative courses					
	Facultative courses	Lecture/seminar/ laboratory	mark	Completed within 4-years cycle	
Total:				Facult. courses.	Facult. courses
Total: obligatory and facultative courses:				135 + Facult. courses	8 + Facult. courses.

Year IV

Obligatory courses					
Code of the module in USOS	Module name	Form of activities	Evaluation method	Number of contact hours	Number of ECTS credits
	Specialisation seminar	seminar	mark	15	2
	III faculty seminar – oral presentation	seminar	mark	30	2
	Apprenticeship	Laboratory	mark	90	4
	Other requirements Laboratory on research project	Laboratory	mark	-	-
	English course	consultation	exam	15	1
	Philosophy	consultation	exam	15	1
Total				165	10
Facultative course					
	Facultative courses	Lecture/seminar/ laboratory	mark	Completed within 4-years cycle	
Total:				Facult. courses.	Facult. courses
Total: obligatory and facultative courses::				165 + Facult. courses.	10 + Facult. courses

Facultative courses are completed within 4-year cycle, total number of ECTS credit for facultative courses: 8

The programme is in force beginning with 2014/2015 academic year

The programme of PhD studies was accepted by the Faculty Council of the Faculty of Biology and Environmental Protection on
(name of faculty)

4.07.2014
(date)

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