



**RESOLUTION No. 00
OF THE SENATE OF THE UNIVERSITY OF WARSAW**

dated 18 January 2023

**on the study programme
at the Doctoral School of Exact and Natural Sciences,**

Pursuant to Article 28, section 1, point 12 of the Act of 20 July 2018, the Law on Higher Education and Science (consolidated text: Journal of Laws, 2022, item 574, as amended) and § 43, sections 1 to 15 of the Statute of the University of Warsaw (UW Monitor, 2019, item 190, as amended) the Senate of the University of Warsaw resolves hereby as follows:

§ 1

A study programme for the Doctoral School of Exact and Natural Sciences is hereby approved, constituting an appendix to the Resolution.

§ 2

The Resolution comes into effect on the day it is adopted and is applicable starting from the academic year of 2023/2024.

Chairperson of the Senate of
the University of Warsaw
Rector: *A. Z. Nowak*

Appendix

to the Resolution No. ... of the Senate of the University of Warsaw dated 18 January 2023
on the study program at the Doctoral School of Exact and Natural Sciences

STUDY PROGRAMME
at the Doctoral School of Exact and Natural Sciences,

name of the study programme;	On the study programme at the Doctoral School of Exact and Natural Sciences
Name of the study programme in English	Study Programme at the Doctoral School of Exact and Natural Sciences
language of instruction	Polish / English
PQF level	8
number of semesters	8
number of ECTS credits	32
academic degree	doctor
academic disciplines in which doctoral studies are conducted	<ol style="list-style-type: none"> 1) astronomy 2) biological sciences 3) chemical sciences 4) physical sciences 5) computer science 6) Earth and related environmental sciences 7) mathematics

Learning outcomes defined for the study programme referring to the characteristics of the second level of the Polish Qualifications Framework for qualifications at level 8

Symbol of learning outcomes for the study programme	Learning outcomes	Reference to the descriptors of degree 2 - of the PQF level 8
Knowledge (W; in Polish: “wiedza”) (the graduate knows and understands)		
WG_01	to the extent that existing paradigms can be revised - a worldwide body of work, covering theoretical foundations as well as general and selected specific issues which are relevant to the scientific discipline in the field of exact and natural sciences	P8S_WG
WG_02	the main development trends of scientific disciplines in the field of exact and natural sciences in which the studies are provided	
WG_03	scientific research methodology within scientific disciplines in the field of exact and natural sciences	
WG_04	the principles for dissemination of scientific results in the field of exact and natural sciences, including in the open access mode	
WK_01	fundamental dilemmas of modern civilisation from the perspective of exact and natural sciences	P8S_WK
WK_02	economic, legal, ethical and other relevant determinants of scientific activities within exact and natural sciences	
WK_03	the basic principles of knowledge transfer to the economic and social areas and commercialisation of the results of scientific activities within exact and natural sciences and of the know-how related to these results	

Skills (U; in Polish: “umiejętności”) (the graduate is able to)		
UW_01	make use of knowledge from a variety of scientific disciplines, in particular exact and natural sciences, creatively identify, formulate and innovatively solve complex problems or perform tasks of a research nature in particular by: defining the purpose and object of scientific research, formulating a research hypothesis, developing research methods, techniques and tools and applying them creatively, inferring on the basis of scientific findings	P8S_UW
UW_02	critically analyse and evaluate the results of scientific research in the field of exact and natural sciences, expert and other creative work and their contribution to the advancement of knowledge.	
UW_03	transfer the results of scientific activities to the economic and social areas	
UK_01	communicate on specialist subjects to the extent necessary for active participation in the international scientific community	P8S_UK
UK_02	disseminate the results of scientific activities in the field of exact and natural sciences, also with the use of popular forms;	
UK_03	initiate debates within the field of exact and natural sciences:	
UK_04	participate in scientific discourse in the field of exact and natural sciences	
UK_05	speak a foreign language at B2 level of the Common European Framework of Reference for Languages to the extent enabling to participate in an international scientific and professional environment	
UO_01	plan and carry out individual and team research or creative projects, within exact and natural sciences, also in an international environment	P8S_UO
UU_01	independently plan and act for their own development, and inspire and organise the development of others	P8S_UU
UU_02	plan and deliver classes or a group of classes in a particular discipline of exact and natural sciences, using modern methods and tools	

Social competences (K; in Polish” “kompetencje społeczne”) (the graduate is ready to)		
KK_01	critically evaluate achievements within a given scientific discipline in the field of exact and natural sciences	P8S_KK
KK_02	critically assess one's own contribution to the development of a scientific discipline	
KK_03	recognise the importance of knowledge in solving cognitive and practical problems within a specific discipline in the field of exact and natural sciences	
KO_01	fulfil the social obligations of researchers and creators	P8S_KK
KO_02	fulfil social obligations and take actions in the public interest, in particular by initiating actions in the public interest	
KO_03	think and act in an entrepreneurial manner	
KR_01	sustain and develop the ethos of the research and creative communities, including: by carrying out scientific activities in an independent manner, by respecting the principle of public ownership of scientific results, taking into account the principles of protection of intellectual property	P8S_KR

Study programme

Name of the subject or of a group of subjects	Form of classes	Number of days number of class hours	ECTS credits	Semester of course delivery	Symbol of learning outcomes for the study programme	Methods to verify learning outcomes
Didactics of higher education	lecture and workshops	15+5	1+0.5	1	UK_02, UU_02, KO_01	Continuous assessment - participation in discussion, project, credit work

Brief course description	The course aims to enhance the knowledge and skills of doctoral students within the scope of planning the pedagogical work, the analysis and evaluation of education processes and the determination and assessment of their outcomes. Issues concerning the regularities and determinants of the teaching-learning process will be discussed. For doctoral students from an implementation doctorate project, the course is not obligatory					
Copyright	lecture	4	0.5	2	WG_04, WK_02, KR_01	credit work
Brief course description	Providing doctoral students with basic knowledge of copyright and related rights in relation to research and teaching activities. As a result, the doctoral student will gain an understanding of plagiarism and the principles of correct use of the work of other researchers. Issues of co-authorship of papers, description of authors' contributions to multi-author publications will also form an important part of this lecture.					
Fundamentals of Functioning in the Scientific World	workshops	26	2	2	WG_03, WG_04, WK_01, WK_02, WK_03, UW_03, UK_01, UK_02, UK_04, UO_01, UU_01, KK_03, KO_02, KO_03, KR_01	Continuous assessment - participation in discussion, project, credit work
Brief course description	A series of workshops introducing doctoral students to the fundamental skills needed to work in the scientific world, such as issues related to ethics, knowledge transfer, commercialisation of research, grant acquisition, or public speaking, and preparing doctoral students to participate in the international scientific community. Doctoral students will learn communication on specialist subjects to the extent necessary for active participation in discussions and will be able to plan and implement individual and team research projects, as well as will acquire the ability to share knowledge. They will become familiar with the fundamental ethical issues in their discipline and gain the ability to prepare grant applications effectively, which will increase the percentage of successful applications.					
Research development - individual classes with a supervisor	individual consultations	30	2	4	WG_01, WG_03, WK_01, UW_01, UW_02, UK_01, UK_04, UO_01, UU_01, UU_02, KK_01, KK_02, KK_03, KO_01, KO_02, KO_03, KR_01	credit on the basis of a positive opinion of the supervisor
Brief course description	During the course, the supervisor introduces an in-depth, practical and theoretical approach tailored to the requirements of an individual doctoral student, knowledge on the conduct of scientific research, including in particular the one on the detailed research methodology of the discipline within which the research is carried out, develops the ability to formulate research					

	hypotheses and scientific inference, as well as planning their own development. The course prepares the doctoral student to critically evaluate the output within the discipline and allows them to develop their own research skills. The course is conducted in the mode of individual consultations, and the schedule of consultations depends on the agreement between the supervisor and the doctoral student. In particularly justified cases, an increase in the class load of up to 70h is possible. Giving consent after consultation with the head of the Unit in which the supervisor concerned is employed.					
Research seminar	seminar	120 (4x30)	8	Between semesters 1 and 8	WG_01, WG_02, WG_03, WK_01, UW_01, UW_02, UK_01, UK_02, UK_03, UK_04, UK_05, UO_01, KK_01, KK_02, KR_01	preparing a presentation, delivering a paper, participation in a discussion
Brief course description	Provided and conducted from a pool of seminars held in the academic unit, related to the department in which the dissertation topic falls. Selection in consultation with the supervisor. Credit on the basis of attendance and delivery of at least two papers throughout the study cycle, in English. In the case of the preparation of a doctoral dissertation in less than eight semesters, the hourly load is reduced accordingly with the approval of the director of the doctoral school.					
Discipline Lecture	Lecture / Practical classes (depending on the discipline)	90 (e.g. 3x30 or 60+30)	6	Between semesters 1 and 6	WG_01, WG_02, WG_03	Examination
Brief course description	The lecture presents key issues in the discipline in an in-depth and elaborate manner, and its aim is to support doctoral students in their scientific development. Each discipline (except Physical Sciences and Computer Science) offers 3 or 4 lectures each, of 30 hours (each) during the first three years of studies. For the discipline of Physical Sciences, one of the lectures (from the Graduate Advanced Physics series) has a 60-hour duration with 30 hours of practical classes (they form an integral part of it). In the Computer Science discipline, 30-hour lectures and 10-hour lectures will be offered as part of the PhD open courses. Lectures are delivered regardless of the number of doctoral students enrolled. Credit is given by examination. Each doctoral student shall gain credit from the lectures totalling 90 hours during semesters I-VI. In justified cases, after consultation with the discipline representative of the Doctoral School Council, the head of the School may agree for the provision of a lecture from outside the lecture pool offered. The lecture shall correspond to the PQF level 8. Given the increasing interdisciplinarity research conducted by doctoral students, it is permissible for a doctoral student to choose lectures from a discipline other than the one to which they are assigned. In this situation, a duly motivated application, supported by the supervisor and the approval of the director of the doctoral school is required. The doctoral student is required to select at least 30 hours of lectures from the discipline to which they are assigned. Where a particular Discipline of Science requires more than one doctoral examination in proceedings					

	for the award of a doctoral degree at the University of Warsaw, it is possible to conduct one of the examinations from their discipline (i.e. from the obligatory lecture with a total of 30h) at an extended level. In this case, the examination could be recognised by the relevant Discipline Council as meeting the requirements of the doctoral examination. This solution requires a resolution to be passed by the Discipline Council. For doctoral students from an implementation doctorate project, attending lectures totalling 60h are required (including an obligatory 30h from the discipline to which a particular doctoral student is assigned).					
Interdisciplinary Conference I (away)	workshops	30	2	4	WG_02, UK_01, UK_02, UK_03, UK_04, UK_05, KK_01, KK_02,	preparing a presentation, delivering a paper, participation in a discussion
Brief course description	The conference is a form of scientific discourse which in its essence encourages the initiation of debate. Such an interdisciplinary event poses an opportunity for doctoral students to look closer at development trends in the exact and natural sciences, and to perceive how they respond to the dilemmas of modern civilisation, as well as gain an insight into how research methodology leads to new discoveries by young researchers (PhD students). The aim of Conference I is to learn about the assumptions of other doctoral students' dissertation projects; and about the research methodology and plans for the dissertation. Doctoral students give oral presentations. This format allows for hands-on practice in techniques facilitating dissemination of results in an environment on which the careers of future researchers do not depend, but which at the same time creates conditions that are similar giving presentations in international forums. The conference provides an opportunity for other doctoral students to critically evaluate the results presented, as well as to take a critical look at their own performance against the performance of others at a similar stage of development. Such critical analysis helps to strengthen the independence of future researchers. In addition, the interdisciplinary format enforces the use of a popular scientific presentation of the results obtained. Presentations are in English. In exceptionally justified situations, participation using remote communication tools is possible. In such a situation, a substantive proposal from the doctoral student, supported by the supervisor and by the approval of the school director are required.					
Interdisciplinary Conference II (away)	Workshops	30	2	7	WG_02, UK_01, UK_02, UK_03, UK_04, UK_05, KK_01, KK_02	preparing a presentation, delivering a paper, participation in a discussion
Brief course description	Conference II is a summary of the results obtained and an attempt to take a mature look at them in view finalising the project, submission of the dissertation and its defence. The presentation format will be tailored to the widest possible audience, which will require appropriate presentation of results and selection of information. Presentations are expected to follow as closely as possible the format of the speeches, which are presented in public defences of doctoral dissertations in particular scientific disciplines. In this way, doctoral students learn about international standards for presenting results and					

	achievements and dissemination of the results of scientific activity in the form of specialist and popular science. Doctoral students give oral presentations.					
Latest discoveries in the exact and natural sciences	lecture	15	1	2	WG_01, WG_02, WG_03, WK_01, UW_02, UK_01, UK_03, UK_04, UK_05	active participation in classes: lecture moderation, participation in discussion
Brief course description	The aim of the lecture is to broaden the cognitive perspective of doctoral students in research and highlighting key developments in various scientific disciplines. The subject will highlight the importance of the concept of significant scientific achievement and stimulate interdisciplinary cooperation. At the same time, it will allow future scientists to gain a broad perspective on exact and natural sciences, while pointing out important dilemmas of contemporary society. Each of the School's seven disciplines presents, for 90 minutes at a time, the latest and most important findings of that discipline. Doctoral students from an implementation doctorate project are required alternatively (at the request of the doctoral student supported by the supervisor and with the approval of the school director) to participate in a scientific conference where lectures from various specialisations are presented in English. The conference programme must include 15 hours of lectures.					
Teaching practice	workshops	From 60 to 180 (depending on the discipline)	6	Between semesters 1 and 8, 180 (depending on the discipline)	UK_02, UU_01, UU_02	Positive opinion of the supervisor or the coordinator of teaching practice
Brief course description	The aim of the course is to practically improve the teaching skills. The form of teaching practice may consist in particular of participation in the preparation of classes dedicated for students studying at first- and second-cycle studies, providing assistance in conducting classes for students at first- and second-cycle studies or independent teaching by a doctoral student. At the substantive request of the doctoral student supported by the supervisor and with the approval of the school director, after prior consultation by the director with the selected representative of the Discipline, the teaching practice load may be reduced. Teaching practice load: 60h (Biological Sciences, Earth and Environmental Sciences), 120h (Astronomy), 180h (Chemical Sciences, Physical Sciences, Computer Science, Mathematics).					
Monographic lecture	lecture	15 - 30 (depending on the discipline)	1-2	Between semesters 1 and 8		credit work

Brief course description	Monograph lecture(s) to be chosen from the list of lectures offered by the faculties. They do not have to meet the requirement of the PQF level 8, but are important in order to achieve relevant scientific competence in the discipline. Although they complement studies in the discipline, they are obligatory. Selection in consultation with the supervisor. The required load of the monograph lectures is 30 hours. The total load of lecture(s) is 15h, 1 credit ECTS (Chemical Sciences) 30h, 2 credits ECTS (Astronomy, Biological Sciences, Physical Sciences, Computer Science, Earth and Environmental Sciences, Mathematics)					
Faculty Seminar (Chemical Sciences)	seminar	15	1	Between semesters 1 and 8		participation in the discussion
Brief course description	For the discipline of Chemical Sciences, the Faculty Seminar is a distinctive element of education found in a large proportion of chemistry research units in Poland and around the world. Attendance at 15 lectures throughout the education cycle is required.					

Total number of ECTS credits (for the entire cycle): 32

Total number of class hours (for the entire cycle): 455–575