Appendix No 5 to Resolution No 74/2020/2021 of the AMU Senate of 22 February 2021

Curriculum of the Doctoral School of Natural Sciences in the academic year 2021/2022

1. Education in the Doctoral School of Natural Sciences of Adam Mickiewicz University in Poznań is conducted on the basis of the framework educational plan and individual research plan. The training lasts 8 semesters.
2. Education at the Doctoral School is interdisciplinary and ends with the submission of a doctoral dissertation.
3. The educational framework includes obligatory and optional course modules.
4. A doctoral student studying at the Doctoral School of Natural Sciences follows an individual study path as specified in the framework study plan.
5. The individual study path is developed by the doctoral student for each academic year, in consultation with the doctoral dissertation supervisor(s) and the head of the doctoral school. The individual study path may be modified in the course of its implementation after a positive opinion of the supervisor(s) and upon the consent of the director of the doctoral school.
6. The individual study path consists of:
   1) courses from the obligatory course module;
   2) Work experience in the form of teaching or participating in the teaching of classes;
   3) courses from the optional course module, if selected;
7. The curriculum offer of the Doctoral School at Adam Mickiewicz University includes obligatory and optional courses. The curriculum offer of the Doctoral School of Natural Sciences at Adam Mickiewicz University is updated annually. Information about offered courses and recruitment for classes is announced via the USOS system at least two weeks before the beginning of the academic year. Information about classes includes data on:
   - course status (obligatory or optional)
   - type and form of classes
   - the language of instruction
   - the assumed learning outcomes;
   - the learning content leading to the achievement of the learning outcomes
   - form of verification of the assumed learning outcomes;
   - contact hours with the academic teacher.
8. Type and form of classes:
   - classes may take the form of lectures, exercises, seminars, workshops, laboratory classes, training and courses, schools (summer/winter), seminars and field classes.
   - classes are conducted in Polish or in a foreign language.
   - the curriculum offer of the School of Natural Sciences enables the doctoral student who does not speak Polish to fulfil the programme requirements.
   - the programme may be conducted on the premises of the university or outside it.

9. Framework plan and schedule of education

I. Obligatory courses

- *Interdisciplinary scientific seminar:* 75 hours
  Classes in consultation with the supervisor

- *Methodology of scientific research:* 25 hours
  Course objective: preparation of methodological basis necessary to conduct research and prepare a doctoral dissertation.

- *Academic didactics:* 15 hours - lectures; 10 hours – workshops
  Course objective: learning the principles, forms and methods of academic education.

- *Work experience:* 30-120 hours
  in the form of teaching or participating in teaching not exceeding 60 teaching hours per year, excluding the first and fourth year of education.

- *Researcher's workshop:* 30 hours
  Course objective and contents: to learn and understand the basics of entrepreneurship and to use this knowledge to transfer and commercialize the results of scientific research; to learn the principles of publishing ethics, responsibility in scientific activity and the importance of popularization of science; copyright and protection of intellectual property.

- *Specific nature of work in a discipline:* 20 hours
  Course objective and contents: to learn the practical aspects of academic work, in particular the classes cover: acquiring funds for research; working in a team and managing a research group, intercultural competences, preparing scientific publications and presenting research results; time management; career planning.

- *Interdisciplinary lecture series:* 30 hours
  Offer of specialist classes in the scope of scientific disciplines represented in the school

II. Optional courses *Interdisciplinary block of elective courses:*
Interdisciplinary block of elective courses, number of hours to be agreed with the supervisor/supervisors

Obligatory classes	**Hours**	**SEMESTER**							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Interdisciplinary scientific seminar	**75**		15	15	15	15	15		
Methodology of scientific research	**25**	25							
Academic didactics	**25**	25							
Researcher's workshop	**30**		15	15					
Specific nature of work in a discipline	**20**		10	10					
Soft skills workshop	**30**				10	10	10		
Specialist lectures	**30-120**			30	30	30	30		
Work experience			x		x		x		x
Optional classes									
Interdisciplinary block of elective courses	d		x	x	x	x	x		

Preparation of doctoral dissertation									
Achievement of the Individual Research Plan		x	x	x	x	x	x	x	x
Mid-term evaluation					x				
Submission of the doctoral dissertation									x
TOTAL classes	**205**								

10. Learning outcomes

According to the Universal Characteristics (1st level) and Characteristics of the 2nd level of the Polish Qualification Framework (defined in the annex to the regulation of the Minister of Science and Higher Education of 14 November 2018 on characteristics of the second degree of learning outcomeş for qualifications at levels 6-8 of the Polish Qualification Framework, Journal of Laws of 2018, item 2218) typical for qualifications obtained within the system of higher education and science for level 8, a person who has completed education at the Doctoral School of Natural Sciences of the Adam Mickiewicz University in Poznań and has submitted a doctoral thesis has knowledge, skills and social competences:

SYMBOL	Learning outcomes	Reference to the second level characteristics of the Polish Qualification Framework for the relevant level of the second level of the Polish Qualification Framework
Knowledge: a person who has completed education at the Doctoral School of Adam Mickiewicz University, knows and understands:		
P8S_WG_1	achievements of world science within the discipline in which the course of study is conducted, as well as paradigms and directions of development of this discipline, in a manner which enables a creative and innovative development of these achievements and their verification as part of research projects undertaken;	P8S_WG
P8S_WG_2	in an advanced level, the methodology of research appropriate to advanced level, the methodology of research appropriate to the discipline of science in which the course is conducted, which enables a proper selection of theories and research tools and their effective application and modification within the framework of one's own research;	
P8S_WG_3	principles of dissemination of the results of scientific activity, by traditional methods and in open access mode;	
P8S_WK_1	legal, ethical and other relevant conditions of scientific activity;	P8S_WK
P8S_WK_2	mechanisms for financing scientific research and acquiring funds for research;	P8S_WK
P8S_WK_3	basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity;	P8S_WK
P8S_WK_4	methodology of conducting classes at the academic level and the use of modern technologies in education;	P8S_WK
P8S_WK_5	fundamental dilemmas of contemporary civilization and the role of science, in particular within the discipline in which the course is conducted, in solving them.	P8S_WK

Skills: a person who has completed education at the Doctoral School of Adam Mickiewicz University is able to:		
P8S_UW_1	apply knowledge from various scientific disciplines to creatively identify, formulate and innovatively solve complex research problems or perform advanced research tasks. In particular he/she is able to: define objectives and subject matter of scientific research, formulate research hypotheses, develop research methods, techniques and tools and apply them creatively and effectively, draw conclusions on the basis of research results;	P8S_UW
P8S_UW_2	effectively acquire information related to scientific activity from various sources, also in foreign languages, and to perform an appropriate selection, critical analysis and interpretation of this information; moreover, they are able to evaluate its significance for the development of science	P8S_UW
P8S_UW_3	transfer the results of scientific activity to the socio-economic sphere, in cooperation with institutions from the social and economic environment;	P8S_UW
P8S_UK_1	prepare scientific publication with respect to copyright law;	P8S_UK
P8S_UK_2	communicate in the field of specialist knowledge in Polish and foreign languages at the B2 level of the Common European Framework of Reference for Languages: Learning, Teaching, Assessment, to the extent allowing an active participation in the national and international discourse of the scientific community in order to exchange knowledge, experiences and ideas;	P8S_UK
P8S_UK_3	present the results of their research and to initiate and lead scientific and popular science discussions in Polish and foreign languages	P8S_UK
P8S_UK_4	initiate and carry out scientific cooperation in research teams, including international ones;	P8S_UK
P8S_UK_5	independently plan their own development, both in terms of scientific and academic activity, as well as other professional activities, and inspire and stimulate the development of others;	P8S_UK
P8S_UO_1		P8S_UO
PS8_UO_2	prepare an application for financing a research project;	PS8_UO
P8S_UU	plan and carry out teaching activities in a methodically correct manner using modern methods and tools.	P8S_UU
Social competence: a person who has completed the Doctoral School at Adam Mickiewicz University is ready to:		
P8S_KK_1	critically appraise work in the scientific discipline in which the teaching is given, and make their own contribution to the development of that discipline;	P8S_KK
P8S_KR_2	act in accordance with the ethical principles applicable to scientific work and interpersonal relations; moreover, be prepared to build the ethos of the scientific and professional community;	P8S_KR
P8S_KO_1	fulfil social responsibilities as a researcher; initiate actions in the public interest, including through appropriate dissemination of the achievements of science in society. Moreover, they are ready to undertake actions leading to the development of a civic society based on knowledge;	P8S_KO

P8S_KO_2	think and act in an entrepreneurial way, to create new ideas and to search - in cooperation with people representing other disciplines - for innovative solutions, as well as to take up challenges and intellectual risks in the scientific and public sphere and to bear responsibility for the consequences of their decisions	P8S_KO
P8S_KO_3	continuously improve their professional competence and personal development, in particular by following and analysing the latest developments related to the represented scientific discipline.	P8S_KO

11. Verification of learning outcomes:
    - the verification of the learning outcomes of a course can take the form of a written and/or oral examination, a written and/or oral credit exam or a public presentation
    - the verification of the learning outcomes of the Work experience takes place on the basis of an audit sheet.
    - active participation in the "Interdisciplinary Doctoral Conference", organised by the doctoral school, is an obligatory element of the educational framework plan.
    - the rules of participation in the "Interdisciplinary Doctoral Conference" and the requirements for doctoral students in particular years of training are determined by the director of the doctoral school
12. Framework curriculum structure referenced to the learning outcomes of the eighth level of the Polish Qualification Framework.

Obligatory classes	**Learning outcomes**
Interdisciplinary scientific seminar	P8S_WG.1; P8S_WK.5; P8S_UW.1; P8S_UW.2; P8S_UK.2; P8S_UK.3; P8S_KK.1; P8S_KR.1; P8S_KO.1; P8S_KO.2; P8S_KO.3
Methodology of scientific research	P8S_WG.2; P8S_UW.1; P8S_UW.2
Academic didactics	P8S_WK.4; P8S_UO.1; P8S_UU.1
Researcher's workshop	P8S_WG.3; P8S_WK.1; P8S_WK.2; P8S_WK.3; P8S_UW.1; P8S_UW.3; P8S_UK.4; P8S_UO.2; P8S_KO.2
Specific nature of work in a discipline	P8S_WK.5; P8S_UK.1; P8S_KO.3
Interdisciplinary lecture series	P8S_UW.2; P8S_UK.2; P8S_KK.1; P8S_KO.3
Work experience	P8S_WK.4; P8S_UO.1; P8S_UU.1; P8S_KR.1
Interdisciplinary doctoral conference	P8S_WG.3; P8S_UW.2; P8S_UK.2; P8S_UK.3; P8S_UK.4; P8S_KK.1; P8S_KR.1; P8S_KO.1; P8S_KO.2
Optional classes	
Interdisciplinary block of elective courses	
Preparation of doctoral dissertation	
Achievement of the Individual Research Plan	P8S_WG.1; P8S_WG.2; P8S_WG.3; P8S_UW.1; P8S_UW.2; P8S_UK.1; P8S_UK.2; P8S_UK.3; P8S_UK.4; P8S_UK.5; P8S_UO.2; P8S_KK.1; P8S_KR.1; P8S_KO.1; P8S_KO.2; P8S_KO.3
Mid-term evaluation	
Submission of the doctoral dissertation	