MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

V.N. Karazin Kharkiv National University

Name of the higher education institution

EDUCATIONAL PROGRAMME

Human and Animal Physiology

Second (Master) level of higher education

Specialty 091 "Biology"

Branch of knowledge 09 "Biology"

Qualification: Master of biology, Human and Animal Physiology

APPROVED BY SCIENTIFIC COUNCIL

OF THE SCHOOL OF BIOLOGY

V.N. KARAZIN KHARKIV NATIONAL UNIVERSITY

Head of Scientific Council _____ / V.S. Bakirov/

(protocol № __ from "___"_____ 2017)

Educational Programme is implemented from _____2017

Rector_____ /V.S. Bakirov/

(order № __ from "___"_____ 2017)

Kharkiv 2017

PREFACE

Developed by working group composed of:

1	**Bondarenko Valeriy Antonovich**	Leader, Guarantor of Educational Programme, Doctor of Science (Biology), Professor, the Head of Department of Human and Animal Physiology, School of Biology
2	**Zhmurko Vasyl Vasylyovych**	Doctor of Science (Biology), professor, head of Department of plant and microorganisms physiology and biochemistry of the School of Biology, Dean of the Biological of the School of Biology
3	**Zhuikova Asya Evgenivna**	Senior Lecturer of Department of Human and Animal Physiology, School of Biology
4	**Koba Liliya Vitalievna**	PhD, Associate Professor of Department of Human and Animal Physiology, School of Biology

1. Profile of Educational Programme in the specialty 091 Biology with Specialization in Human and Animal Physiology

1 – General information	
Full name of higher education institution and its structural unit	V.N. Karazin Kharkiv National University, School of Biology
Higher education level and qualification name	Second (master) level of Higher Education Qualification: Master of Biology, Human and Animal Physiology
Official name of educational program	Educational Programme "Human and Animal Physiology"
Type of Diploma and Curriculum volume	Master's diploma, single, 90 ECTS credits, period of study – 1 year and 4 months
Accreditation	Accredited by Ministry of Education and Science of Ukraine in the master's level, НД № 2189559 from 18 .09.2017 to 01.07.2023
Cycle/Level	National Qualification Framework of Ukraine – level 8, FQ-EHEA – second cycle, EQF-LLL – level 7
Preconditions	Barchelor's degree/educational qualification level of specialist/master. Requirements for competitive selection are determined by the University's rules of admission for Master's Programmes.
Language(s) of teaching	English, Ukrainian, Russian
Period of validity of the Programme	until 01 July 2023
Internet address of permanent hosting of curriculum description	http://start.karazin.ua/i/programs http://biology.karazin.ua/index-eng.html
2 – Scope of Educational Programme	
Deepened fundamental, specialized and practical training of masters in Biology with specialization in the field of Human and Animal Physiology	
3 – Description of the Educational Programme	
Subject area (branch of knowledge, specialty, specialization)	Branch of knowledge 09 Biology Specialty 091 – Biology Specialization – "Human and Animal Physiology"
Orientation of Educational Programme	Educational and professional
Main focus of Educational Programme and specialization	Deepened special education in the field of Biology, specialty "Biology". Study of the fundamental principles of structure and functions of biological systems of different organization levels, their interactions with the environment, reactions to various conditions, as well as at various stages of onto- and phylogenesis; study of biodiversity and evolution of living systems; of the importance of living organisms in biospheric processes, biotechnologies, economy, healthcare, environment protection

	and sustainable nature management. Mastering innovative approaches to solving theoretical and experimental problems in Biology, Human and Animal Physiology and related sciences, in order to investigate and assess biological systems state, to use them, monitor and evaluate environmental state with further implementation of the achievements into economy and social sphere. Key words: Biology, Biochemistry, Genetics, Cytology, Human and Animal Physiology, Bioecology, Botany, Zoology, Animal Ecology, Plant Physiology and Biochemistry, Microbiology, Mycology, Phytoimmunology, Molecular Biology, Biotechnology.
Distinctive features of Educational Programme	The Programme is implemented in active research environment. The technologies of distance education are used.
4 – Employability and further education	
Employability	Professional activity in the field of biology, agriculture, medicine, biotechnology, nature protection and rational nature management. Research Associate, lecturer in Higher education institution
Further education	Right to continue study at the third educational scientific level of higher education. Acquiring of additional qualifications in other specialties in the system of postgraduate education.
5 – Teaching and assessment	
Teaching and learning	Student-centered, problem-oriented learning, initiative self-education. Lectures possess problem character and use analysis, synthesis, comparison, modeling, analogy, dialectics, abstraction, specification, systematic, historical and logical approaches. Laboratory and practical lessons are carried out in small groups with application of experimental research methods, statistical processing of experimental data, information and communication technologies. Educational and methodological support of individual learning is provided by the distance learning elements: electronic lectures, methodical guidelines and tasks. Accent is made on personal self-development promoting the formation of needs and readiness to continue the self-education throughout life.
Assessment	Current testing, presentations of certain topics of theoretical course, essays, individual educational research assignments, reports on practice results. Students' learning achievements are assessed by 4-level (excellent, good, satisfactory, unsatisfactory) or 2-level national scale (passed, not passed). 100 scores system. Final attestation – public defense of Master's Research Project
6 – Programme Competences	
Integral competence	Ability to solve complex tasks and problems in the field of Biology and in interdisciplinary fields that includes the research and/or innovation development and is characterized by uncertainty of conditions and demands.
Generic competences (GC)	GC1. Possession of basic general knowledge in the volume sufficient for scientific worldview formation. GC2. Ability to abstract thinking, information analysis and synthesis based on scientifically reliable facts and logical arguments in the field of biology and within interdisciplinary borders.

	GC3. Ability to information search and analysis using different sources including the results of original research. GC4. Assimilation of basic professional knowledge in the volume sufficient for independent work in specialty as well as ability to assimilate new information and acquire new skills and abilities throughout life. GC5. Assimilation of flexible thinking that gives the ability to understand and solve the problems and tasks using critical attitude towards established scientific concepts. GC6. Ability to generate new ideas (creativity). GC7. Ability to implement knowledge in practice, effectively solve practical problems using professional knowledge. GC8. Research skills and abilities. Ability to identify perspective directions of research, formulate the research scope and tasks. GC9. Ability to use modern information technologies and to analyze information in the field of biology, human and animal physiology and within interdisciplinary borders GC10..Ability to perform professional activity and carry out the researches at an appropriate level in the field of biology, human and animal physiology and in within interdisciplinary borders GC11. Ability to act in compliance with the moral and ethical principles in the professional field and the need for intellectual honesty, with social responsibility and conscious. GC12. Interpersonal skills and abilities. Ability to work in a team and under supervision of a leader, ability to communicate in professional activities, including in an international level
Professional competences of specialty (PC)	PC1. Deep systemic knowledge about conditions, patterns, mechanisms of metabolism, energy exchange, functioning and adaptation of living organisms, their characteristics at the cellular and molecular levels of organization, the ability to apply this knowledge in worldview formation and interpretation of original researches. PC2. Possession of fundamental biological concepts (adaptation, ontogenesis, evolution, etc.), ability to use them for original research interpretation. PC3. Knowledge of current scientific issues in the field of specialization and ability to analyze the ways modern human and animal physiology development. PC4. Ability to apply theoretical and methodological knowledge in the field of biological sciences and within interdisciplinary borders for implementation of professional tasks, including research of structural and functional features, patterns and mechanisms of functioning at different levels of organization. PC5. Ability to generate and experimentally test original hypotheses concerning the structural and functional characteristics of different components in living organism and their patterns and mechanisms of functioning, functioning and adaptation of living organism in general. PC6. Ability to plan and carry out physiological researches within interdisciplinary borders, providing informational, methodical and material support. PC7. Ability to use biological databases and computer programs for the analysis of biological information.

	PC8. Ability to interpret the results of original researches, draw conclusions and prepare research manuscripts for publication PC9. Ability to make decisions on important problems of biology and on the boundaries between subject areas on the basis of understanding of modern scientific facts, concepts, theories, principles and methods PC10. Ability to perform the work in accordance with the rules of biological ethics, biosafety, biosecurity PC11. Ability to formulate modeling tasks, create models of objects and processes in living organisms and their components using mathematical methods and information technologies. PC12. Skills of reasoned discussion and communication in the field of biological sciences, human and animal physiology and within interdisciplinary borders. PC13. Ability to understand information from related fields of knowledge and to clarify specific professional issues to experts in other fields. PC14. Ability to apply the pedagogical and psychological foundations in the educational process in higher education institutions. PC15. Understanding career perspectives, planning and managing career. PC16. Ability to solve inventive tasks in the field of biology or using biological effects PC17. Ability to carry out researches and teach in accordance with the standards of academic integrity
7 – Programme Learning Outcomes (LO)	
	LO1. To know the specific features of modern biological science development, the main methodological principles of scientific research, methodological and methodical tools for carrying out scientific research in specialization LO2. Be able to break down the information into components, understand their interrelations and organizational structure, identify errors and limits in logic of reasoning, evaluate the significance of biological data. LO3. Find the ways to quick and efficient solution of set task, propose innovative solutions, to generate ideas using the acquired knowledge and skills. LO4. Know the directions and methodology of information search, analysis and systematization of information in the field of modern human and animal physiology. LO5. Use libraries, databases, internet-resources to search and analyze scientific information. LO6. Know the basic rules of biological ethics, biosecurity, bio-protection, basic approaches to risk assessment using the latest biological, biotechnological, medical and biological methods and technologies. LO7. To adhere to the norms of academic integrity while studying and conducting scientific activities in order to ensure confidence in the results of scientific work, to know the basic legal categories and the peculiarities of using intellectual activity results LO8. Be able to carry out statistical processing, analysis and generalization of experimental data obtained using software and modern information technologies applied in the field of biology and human and animal physiology. LO9. Present the results of scientific work in written form (in the form of a

	report, scientific publications, etc.) and orally (in the form of reports and report defense) using modern technologies, to conduct the discussion correctly. LO10. Be able to communicate in dialogue manner with colleagues and the target audience in Ukrainian and English. LO11. Determine own contribution to the business, carry out coordinated work on the result, taking into account public, state and industrial interests LO12. Possession of systemic knowledge about conditions, patterns, mechanisms of metabolism, energy exchange, functioning and adaptation of living organisms, their characteristics at the cellular and molecular levels of the organization. LO13. Know and analyze the principles of structural and functional organization, mechanisms of regulation and adaptation of organisms in general and at different levels of their organization. LO14. Know the principles of algorithm developing and research and search activity by specialization LO15. Be able to identify perspective directions of researches in modern biology and human and animal physiology. LO16. Use innovative approaches to solve specific tasks, take part in development of technological innovations in the field of human and animal physiology, evaluate consequences of their implementation. LO17. Apply pedagogical technologies at the level sufficient for realization of developed programs of educational disciplines of specialization in higher educational institutions LO18. Know the methodology of modeling of objects and processes in living organisms and their components using mathematical methods and information technologies LO19. Be able to provide professional consulting in the field of human and animal physiology, molecular biology and related sciences.
8 – Resource supply of Programme realization	
Staffing	Guarantor of the educational program: Vasil V. Zhmurko - Dean of the School of Biology of V.N. Karazin Kharkiv National University, DrSci, Professor. Scientific and pedagogical staff with academic degrees as well as highly skilled specialists are involved in the Programme realization. In order to raise the professional level, all scientific and pedagogical staff undertake an internship once every five years, including internship abroad. Lectures, seminars, workshops, master classes with the participation of specially invited foreign specialists are held.
Material and technical support	Educational buildings include auditoriums and thematic rooms with multimedia equipment, specialized educational and research laboratories, computer classes with access to the Internet. Various collections of biological objects are used in educational and scientific activities, two of which (CWU herbarium and Drosophila lines collection) have the status of National heritage of Ukraine. There is an opportunity to perform research projects both on the basis of the university and on the basis of specialized laboratories in the partner institutions (under the terms of the contract). University-based research laboratories include: Laboratory of cell culture and animal tissue culture, Laboratory of Cell Biochemistry and Molecular Genetics,

	Laboratory of Bioinformatics, Molecular genetic laboratory, Laboratory of callus cultures "Morphogenesis in vitro", Laboratory of microbiology and microbiological box, Laboratory of aquaculture with a collection of algae cultures, Laboratory for pure cultures of fungi, Plant Disease Diagnostic Laboratory, Laboratory of Parasitology, Laboratory of invertebrate taxonomy, Laboratory of genetics of vertebrate, Laboratory of Genetics of Ontogenesis (National heritage of Ukraine). Students are provided by places in dormitories. There is a sports hall, sports grounds, various sports sections and cultural centers. The points of nutrition offer a quality menu, including the Halal Certificate.
Information, teaching and methodological support	The official website of VN Karazin Kharkiv National University: http://biology.karazin.ua/; wireless access to the Internet; unlimited internet access; scientific library, virtual learning environment Moodle; corporate mail; training and work plans; curricula of the educational process; educational-methodical complexes of disciplines; educational and work programs of disciplines; didactic materials for students self- and individual work by disciplines; practice courses programs; methodical instructions for the implementation of individual tasks, control and diploma projects; criteria for assessing the level of training; packages of complex control works, online course support (elements of online courses).
9 – Academic mobility	
National Credit Mobility	Applicants of higher education can realize the right to academic mobility in higher educational institutions and scientific institutions of Ukraine on the basis of agreements and on their own initiative on the basis of an individual invitation.
International Credit Mobility	Erasmus Mundus, DAAD German Academic Exchange Program, Fulbright Fellowship Program, Open Society Institute Programs (Washington), etc, as well as individual invitations from higher education institutions and research institutions outside of Ukraine.
Teaching foreign applicants	Foreign citizens study on a paid basis (on a contract basis) at the expense of individuals and legal entities. All other requirements are governed by the University's Rules of admission.

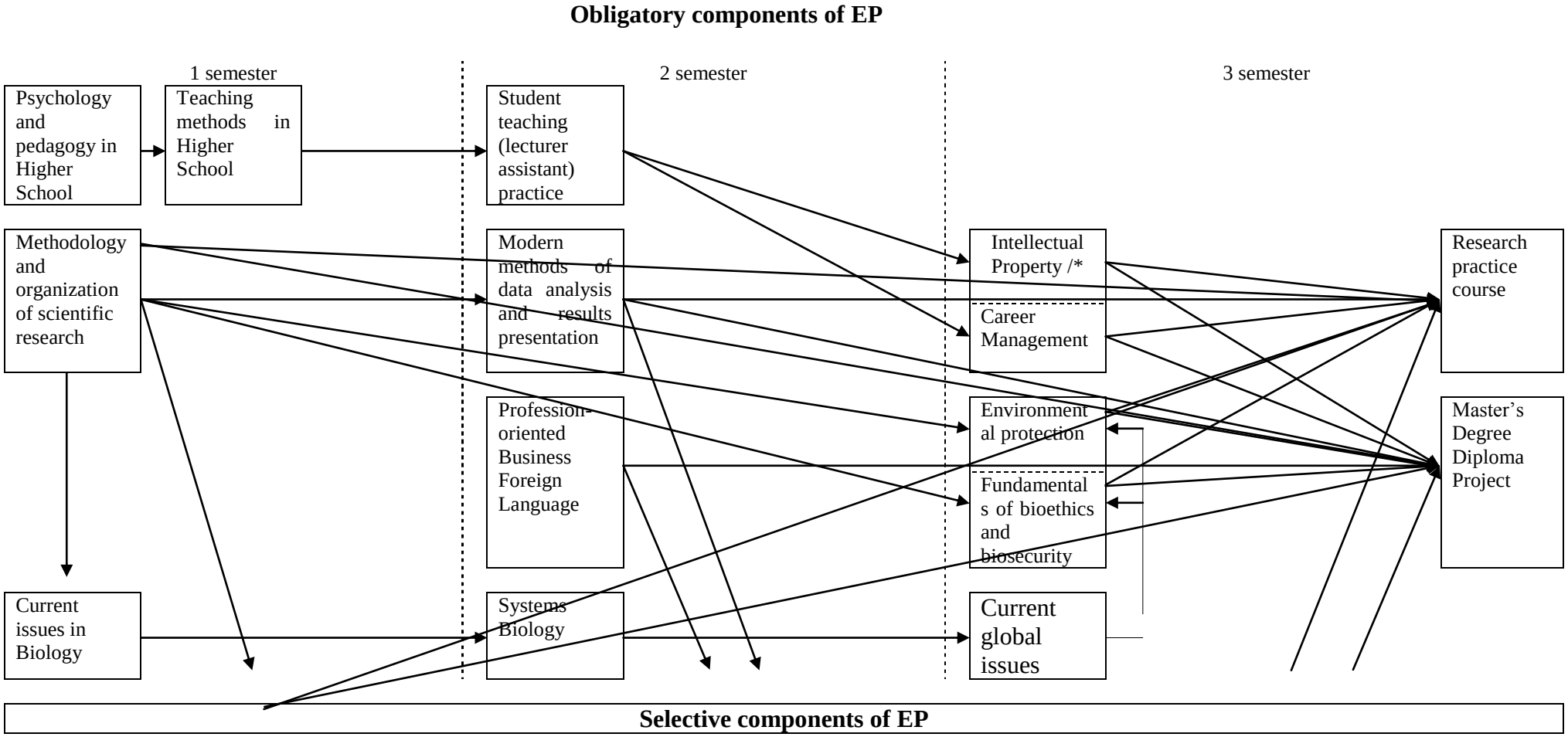
2. The list of components of the Educational Programme and their logical consistency

2.1. The list of components of the Educational Programme (EP)

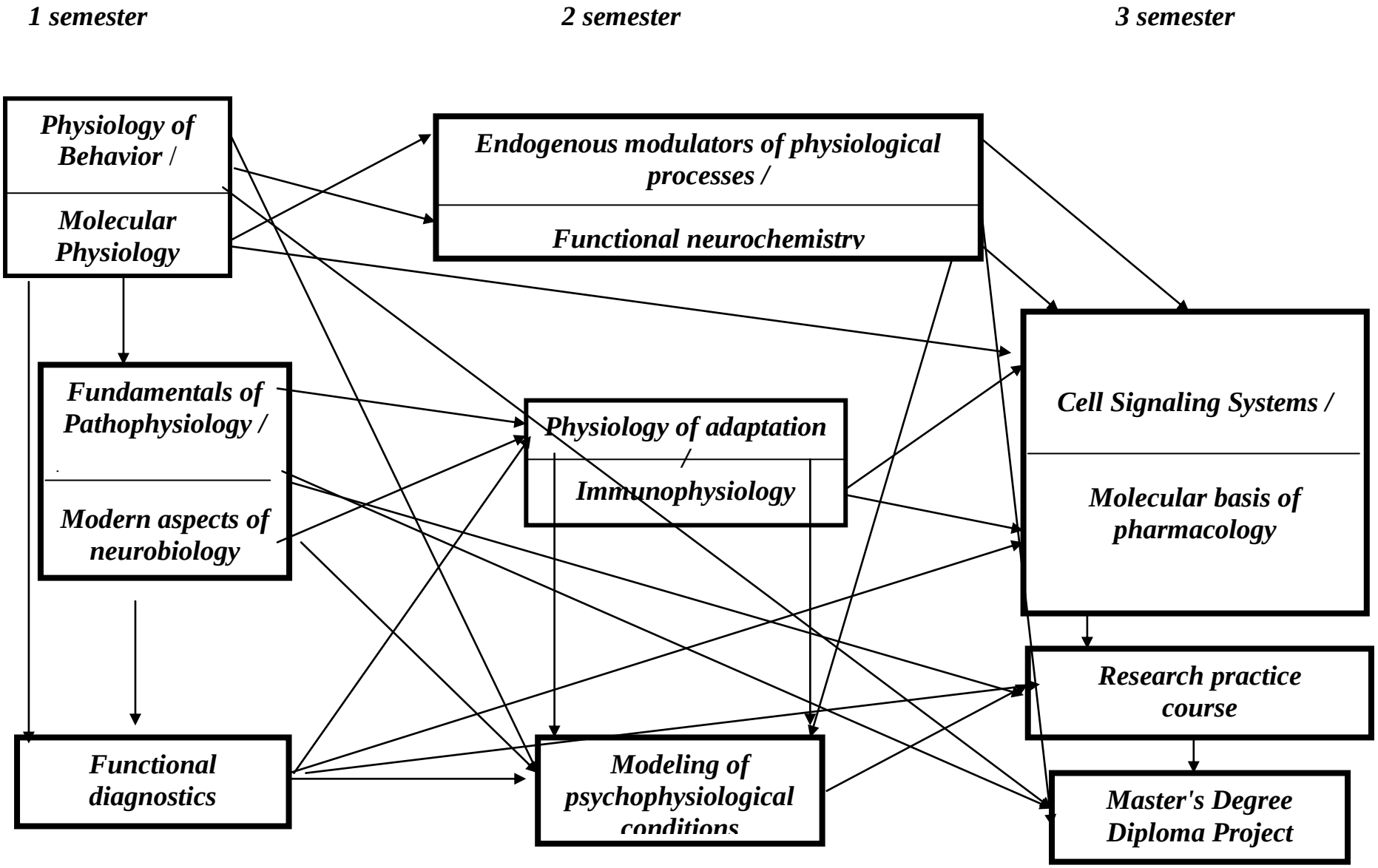
Code	Components of the educational programme (educational disciplines, course projects (work), practice courses, qualification work)	Number of credits	Form of final control
1	2	3	4
Obligatory components of EP			
MC 1.	Methodology and organization of scientific research	4	exam
MC 2.	Teaching methods in Higher School	4	credit
MC 3.	Psychology and pedagogy in Higher School	3	credit
MC 4.	Systems Biology	5	exam
MC 5.	Profession-oriented Business Foreign Language	4	credit
MC 6.	Current issues in Biochemistry	5	exam
MC 7.	Modern methods of data analysis and results presentation	4	credit
MC 8.	Student teaching (lecturer assistant) practice	7	credit
MC 9.	Global issues of Today	3	credit
MC 10/11.	Intellectual Property / * Career Management	3	credit
MC 12/13.	Environmental protection / Fundamentals of Bioethics and Biosecurity	3	credit
MC 14.	Master's Degree Diploma Project (thesis)	12	defense
MC 15	Research practice course	6	credit
Total amount of mandatory components		**63**	
	Selective components of EP		
SC 1/2	Physiology of Behavior/ Molecular Physiology	4	exam
SC 3/4	Fundamentals of Pathophysiology / Modern aspects of neurobiology	3	exam
SC 5/6	Endogenous modulators of physiological processes / Functional neurochemistry	4	exam
SC 7/8	Physiology of adaptation / Immunophysiology	4	exam
SC 9	Functional diagnostics	4	credit
SC 10	Modeling of psychophysiological conditions	5	credit
SC 11/12	Cell Signaling Systems / Molecular basis of pharmacology	3	exam
Total amount of selective components:		**27**	
TOTAL VOLUME OF EDUCATIONAL PROGRAMME		**90**	

/* **- Optional disciplines**

2.2. Logic diagram of EP structure



Selective components of EP



3. Form of certification of graduates

Attestation of graduates of the Educational Programme in specialty 091 Biology is carried out in the form of defense of the qualifying Master's Research Project and results in awarding a Master's degree (with certified document of the government-approved format) with the **qualification**:

Master of Biology, Human and Animal Physiology

The certification is carried out openly and publicly.

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Qualification Project should meet the requirements:

• should provide the solution of a theoretical or practical problem with the application of fundamental provisions and methods of systems analysis, characterized by complexity and uncertainty of the conditions;

• should contain an analysis of the current state of the problem being solved, the working hypothesis;

• should describe the methods applied and the results obtained;

• should contain analysis and theoretical substantiation (discussion) of the research results;

• must be written in scientific style, in Ukrainian (and/or in English);

• must be tested for plagiarism;

• the abstract of the work should be put on the site of the higher educational institution.

4. Correspondence matrix of Educational Programme competences and components

	ОК 1	ОС 2	ОС 3	ОС 4	ОС 5	ОС 6	ОС 7	ОС 8	ОС 9	ОС 10	ОС 11	ОС 12	ОС 13	ОС 14	ОС 15	SC 1	SC 2	SC 3	SC 4	SC 5	SC 6	SC 7	SC 8	SC 9	SC 10	SC-11	SC -12
GC 1	+	+		+		+			+			+	+	+	+	+	+		+		+	+	+	+	+	+	
GC 2	+		+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
GC 3	+			+			+							+	+	+	+		+								
GC 4				+		+																+	+			+	+
GC 5	+					+	+		+															+	+		
GC 6										+																	
GC 7							+											+		+	+			+	+		
GC 8	+						+							+	+												
GC 9																											
GC 10	+						+						+	+													
GC 11											+	+	+														
GC 12		+	+		+			+																			
PC 1									+										+	+	+	+	+		+		
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PC 13		+	+		+			+	+																		
PC 14		+	+		+			+																			
PC 15											+																
PC 16										+																	
PC 17	+						+							+	+												

5. Matrix of implementation of Educational Programme learning outcomes (LO) by corresponding components

	OC 1	OC 2	OC 3	OC 4	OC 5	OC 6	OC 7	OC 8	OC 9	OC 10	OC 11	OC 12	OC 13	OC 14	OC 15	SC 1	SC 2	SC 3	SC 4	SC 5	SC 6	SC 7	SC 8	SC 9	SC 10	SC 11	SC 12
LO 1	+						+							+	+												
LO 2	+						+							+	+										+		
LO 3										+																	
LO 4	+						+			+																	
LO 5				+																							
LO 6											+	+	+														
LO 7											+	+	+														
LO 8	+							+						+	+												
LO 9		+	+		+			+																			
LO 10		+	+		+			+																			
LO 11											+	+	+														
LO 12																+	+		+	+	+	+	+			+	
LO 13																+	+	+	+	+	+	+	+	+	+	+	
LO 14	+						+							+	+									+	+		
LO 15						+												+	+					+	+	+	+
LO 16										+																	
LO 17		+	+		+			+																			
LO 18				+																					+		
LO 19				+					+							+	+	+	+	+	+	+	+	+	+	+	+