Federal State Autonomous Educational Institution of Higher Education "Peoples' Friendship University of Russia named after Patrice Lumumba"

Faculty of Humanities and Social Sciences

(name of the main educational unit (MEU) – developer of the program)

Department of Ontology and Theory of Knowledge

(name of the basic educational unit (BEU) – developer of the program)

WORKING PROGRAM OF THE DISCIPLINE

History and philosophy of science

(name of discipline/module)

The discipline is mastered within the framework of the implementation of postgraduate programs in the following groups of scientific specialties:

1.5. Biological sciences
4.1. Agronomy, forestry and water management
4.2. Animal science and veterinary science

(code and name of the group of scientific specialties)

2025

1. THE GOAL OF MASTERING THE DISCIPLINE

The purpose of mastering the discipline "History and Philosophy of Science" is to prepare postgraduate students for the candidate's exam in the history and philosophy of science. The preparation consists of two stages. The first stage is the study of the history of the branch of knowledge in which the postgraduate student (applicant) is conducting dissertation research. The second stage is the study of the philosophy of science, which includes two levels - mastering the general problems of the philosophy of science and studying the philosophical problems of the specific branch of scientific knowledge in which the dissertation research is being conducted.

2. REQUIREMENTS TO THE RESULTS OF MASTERING THE DISCIPLINE

As a result of mastering the discipline “History and Philosophy of Science”, the postgraduate student must:

Know:

the main concepts and notions of the philosophy of science, the history of the development of scientific knowledge, the history of the formation and development of the scientific picture of the world; the main problems associated with the demarcation of science, ontological, epistemological, social and axiological aspects of the philosophy of science, various methods of scientific knowledge of the world.

Be able to:

use knowledge of the philosophy of science to evaluate and analyze various methodological, interdisciplinary, ethical, social, cultural trends, facts and phenomena. Analyze philosophical and scientific texts and highlight the semantic constructions contained in them, correctly and convincingly formulate the results of mental activity, work with scientific texts and the semantic constructions contained in them. Format text material, analysis results and theoretical conclusions into a scientific article.

Own:

culture of thinking, methods and techniques of logical analysis, oral and written presentation of basic philosophical and scientific knowledge, skills in analyzing philosophical and scientific texts, techniques for conducting discussions and polemics, skills in public speaking and written presentation of one’s own point of view.

3. SCOPE OF THE DISCIPLINE AND TYPES OF STUDY WORK

The total workload of the “Foreign Language” discipline is 4 credit units (180 academic hours).

Type of academic work		**Total, ac . h.**	**Semester**
			2
Contact work		68	68
including:			
Lectures (LC)		40	40
Laboratory work (LW)		-	-
Practical/seminar classes (SZ)		28	28
Independent work of students			
Control (exam)		40	40
General complexity of the discipline	ak . h.	144	144
	. unit	4	4

4. CONTENT OF THE DISCIPLINE

Name of the discipline section	**Section Contents (Topics)**	**Type of academic work**
GENERAL PROBLEMS OF PHILOSOPHY OF SCIENCE		
Section 1. Subject and main concepts of	Topic 1.1. Three aspects being sciences: science as a cognitive activity, as a social institution, as a special sphere of culture. Modern philosophy sciences as a study of the general laws of	OK

modern philosophy of science	scientific knowledge in its historical development and changing socio-cultural context.	
	Topic 1.2. Evolution of approaches to the analysis of science. Logical-epistemological approach to the study of science. The positivist tradition V philosophy sciences. Expanding the field of philosophical problems in post-positivist philosophy of science. Concepts TO. Popper, AND. Lakatos , T. Kuna, P. Feyerabend , M. Polanyi .	LK, SZ
	Topic 1.3. Sociological and cultural approaches To research into the development of science. The problem of internalism and externalism V understanding mechanisms of scientific activity.	OK
Section 2. Science in Culture modern civilization	Topic 2.1. Traditionalist and technogenic types of civilization development And their basic values. The value of science rationality.	OK
	Topic 2.2. Features of scientific knowledge. Science And philosophy. Science And art. Science and everyday knowledge. The role of science in modern education and personality development. The functions of science in the life of society (science as a worldview, as a productive And social force).	OK
Chapter 3. The emergence of science and its main stages her historical evolution	Topic 3.1. Pre-science And science V in the proper sense of the word. Two strategies for generating knowledge: generalization of practical experience and construction of theoretical models that provide exit for framework existing historically established forms of production And ordinary experience.	OK
	Topic 3.2. The culture of the ancient polis and its formation first forms theoretical science. Ancient logic and mathematics. Development logical normal scientific thinking and the organization of science in medieval universities. The role of Christian theology V change in contemplative positions scientist: man is a creator with a small letter; manipulation with natural objects – alchemy, astrology, magic. Western and eastern medieval science.	OK
	Topic 3.3. Formation of experimental science in the new European culture. Formation of ideals of mathematized and experimental knowledge: Oxford school, R. Bacon, W. Ockham. Prerequisites for the emergence of experimental method And his connections with the mathematical description of nature: G. Galileo, F. Bacon, R. Descartes. The ideological role of science in the new European culture. Sociocultural prerequisites for the emergence of the experimental method and its connection with mathematical description nature.	LK, SZ
	Topic 3.4. Formation sciences as a professional activity. The emergence of disciplinary organized science. Technological applications of science. Formation of technical sciences. Formation social and humanities. Ideological foundations of socio-historical research.	OK
Chapter 4. The structure of scientific knowledge	Topic 4.1. Scientific knowledge as a complex developing system. Manifold types of scientific knowledge. Empirical and theoretical levels, criteria for their distinction. Features of the empirical and theoretical language of science. The structure of empirical knowledge. Experiment and observation. Random and systematic observations. Application of natural objects V	OK

	functions instruments in systematic observation. Observation data as a type of empirical knowledge. Empirical dependencies And empirical facts. Fact formation procedures. Problem theoretical fact loading .	
	Topic 4.2. Structure theoretical knowledge. Primary theoretical models And laws. Developed theory. Theoretical models as an element of the internal organization of theory. Limitations of the hypothetico-deductive concept of theoretical knowledge. The role of constructive methods in deductive development theories. Deployment Theories as a process of problem solving. Paradigmatic examples of problem solving as part of the theory. Problems genesis samples. Mathematization of the theoretical knowledge. Types interpretation of the mathematical apparatus of the theory.	SZ
	Topic 4.3. Foundations of science. Structure of foundations. Ideals And norms research, and their socio-cultural dimension. The system of ideals and norms as a scheme of the method of activity. Scientific picture of the world. Historical forms of the scientific picture of the world. Functions of the scientific picture of the world (picture of the world as ontology, as a form of systematization knowledge, How research program). Operational foundations of the scientific picture of the world. The relationship of the ontological postulates of science to the worldview dominants of culture. Philosophical grounds sciences. The role of philosophical ideas and principles in justification scientific knowledge. Philosophical ideas as a heuristic of scientific research. Philosophical justification as a condition for the inclusion of scientific knowledge in culture. Logic and methodology of science. Methods of scientific knowledge And their classification.	LK, SZ
Chapter 5. The dynamics of science as a process of generating new knowledge	Topic 5.1. Historical variability of mechanisms for generating scientific knowledge. Interaction reasons sciences And experience as the initial stage of the formation of a new discipline. The problem of classification. The feedback of empirical facts on the foundations of science. Formation of primary theoretical models And laws. The role of analogies in theoretical search. Procedures for substantiating theoretical knowledge. The relationship between the logic of discovery and the logic of justifications. Mechanisms development of scientific concepts.	OK
	Topic 5.2. Formation of a developed scientific theory. Classical and non-classical variants of theory formation. Genesis of problem solving patterns. Problem situations V science. Outgrowing private tasks into problems. Development of the foundations of science under the influence new theories. Problem inclusion of new ones theoretical representations into culture.	OK
Section 6. Scientific Traditions And scientific revolutions.	Topic 6.1. Interaction of Traditions and the Emergence of New Knowledge. Scientific Revolutions How perestroika reasons science. Problems typologies scientific revolutions. Intradisciplinary mechanisms of scientific revolutions. Interdisciplinary interactions and "paradigm grafting" as a factor	OK

Types of scientific rationality	in revolutionary transformations in science. Sociocultural prerequisites for global scientific revolutions. Restructuring the foundations of science and changing the meanings of worldview universals cultures. Prognostic the role of philosophical knowledge. Philosophy as the generation of categorical structures, necessary For development new types of system objects.	
	Topic 6.2. Scientific revolutions How bifurcation points in the development of knowledge. Nonlinearity of knowledge growth. The selective role of cultural traditions in choosing strategies for scientific development. The problem of potential histories sciences. Global revolutions And types of scientific rationality. Historical change of types of scientific rationality: classical, non-classical, post-non-classical science.	LK, SZ
Chapter 7. Features of the modern stage of development of science. Prospects of scientific and technical progress	Topic 7.1. Main characteristics of modern, post-non-classical science. Modern processes of differentiation and integration of sciences. Connection between disciplinary and problem-oriented research. Mastering self-developing "synergetic" systems And new strategies of scientific search. Role nonlinear dynamics and synergetics in the development of modern ideas about historical developing systems. Global evolutionism as a synthesis of evolutionary and systemic approaches. Global evolutionism And modern scientific picture of the world. Convergence of the ideals of natural science and social and humanitarian knowledge.	OK
	Topic 7.2. Comprehension connections social and intra-scientific values as a condition for the modern development of science. Inclusion of social values in the process of choosing strategies research activities. Expansion of the ethos of science. New ethical problems of science at the end of the 20th century. The problem humanitarian control V science and high technologies. Ecological and socio-humanitarian expertise scientific and technical projects. The crisis of the ideal of value-neutral research and the problem of ideologized science. Environmental ethics and its philosophical foundations. The philosophy of Russian cosmism and the teaching of V. I. Vernadsky on the biosphere, technosphere and noosphere. Problems of environmental ethics V modern Western philosophy (B. Callicot , O. Leopold, R. Attfield).	LK, SZ
	Topic 7.3. Post-non-classical science and the change in the worldview attitudes of the technogenic civilization. Scientism and anti-scientism . Science and parascience. The search for a new type of civilizational development and new functions of science in culture. Scientific rationality And problem dialogue cultures. Role sciences V overcoming modern global crises.	OK
Section 8. Science as a social Institute	Topic 8.1. Various approaches To definition of the social institution of science. Historical development of institutional forms of scientific activity. Scientific communities and their historical types (republic scientists 17th century; scientific communities eras disciplinary organized science; formation of interdisciplinary communities sciences XX century). Scientific schools. Training of scientific personnel.	OK

	Topic 8.2. Historical development of broadcasting methods scientific knowledge (from handwritten editions to the modern computer). Computerization of science and its social consequences. Science and economics. Science and power. Problem secrecy And closed nature of scientific research. The problem of state regulation of science.	OK
MODERN PHILOSOPHICAL PROBLEMS AREAS SCIENTIFIC KNOWLEDGE		
Chapter 9. Philosophical problems of biology and ecology	Topic 9.1. Item philosophy biology and its evolution. The nature of biological knowledge. The essence and specificity of philosophical and methodological problems of biology. Main stages transformation of ideas about the place and role of biology in the system of scientific knowledge. Evolution in understanding subject biological science. Changes V strategies research activities V biology. Role philosophical reflection in the development of life sciences. Philosophy of biology in the study of the structure biological knowledge, V studying nature, features And specifics scientific knowledge of living objects and systems, in the analysis of the means and methods of such knowledge. Philosophy biology V assessment the cognitive and social role of life sciences in modern society.	LK, SZ
	Topic 9.2. Biology V context philosophy and methodology of science in the 20th century. The problem of the descriptive and explanatory nature of biological knowledge in the mirror of neo-Kantian oppositions between ideographic and nomothetic sciences (1920-1930s gg.). Biology through the prism of the reductionist-oriented philosophy of science of logical empiricism (1940-1970s gg.). Biology With dots from the point of view of anti-reductionist methodological programs (1970-1990s). The problem of "autonomous" status biology How science. The problem of "biological reality". Multiplicity "images biology" in modern scientific and biological and philosophical literature.	OK
	Topic 9.3. Essence alive And problem its origin. The concept of life in modern science and philosophy. Diversity approaches To definition of the phenomenon of life. The relationship between philosophical and natural science interpretations life. The main stages of development of ideas about the essence alive And problem origin of life. Philosophical analysis of the foundations of research into the origin and essence of life.	LK, SZ
	Topic 9.4. The principle of development in biology. Basic stages formations ideas development in biology. The structure and basic principles of evolutionary theory. The development of evolutionary ideas: first, second And third evolutionary syntheses. The problem of biological progress. The role of biological theory evolution V the formation of the principles of global evolutionism.	OK
	Topic 9.5. From biological evolutionary theory to global evolutionism. Biology and the formation of modern evolutionary paintings peace. Evolutionary ethics as a study of population-genetic mechanisms of altruism formation in wildlife. Adaptive character And genetic determination of sociability . From altruism to moral norms, from sociability — To human society. The concepts of good and evil in an evolutionary-ethical	OK

	perspective. Evolutionary epistemology as an extension of evolutionary ideas to the study of cognition. Prerequisites and stages of formation evolutionary epistemology. Kant's a priori in light of the biological theory of evolution. Evolution of life as a process "knowledge". Problem truths V in the light of the evolutionary-epistemological perspective. Evolutionary-genetic origin aesthetic emotions. Higher aesthetics emotions at human How a consequence of evolution based on natural selection Categories arts V bioesthetic perspective.	
	Topic 9.6. Problem systemic organization in biology. Organization And integrity of living systems. Evolution of ideas about organization and systematicity in biology (based on the works of A. A. Bogdanov, V. I. Vernadsky, L. von Bertalanffy , V. N. Beklemishev). The principle of systematicity in the sphere of biological knowledge How path implementation of a holistic approach to the object in the context of the diverse differentiation of modern knowledge about living objects.	OK
	Topic 9.7. Problem determinism in biology. The place of the target approach in biological research. The main areas of discussion of the problem of determinism in biology: teleology, mechanical determinism, organic determinism, accidentalism , finalism. Determinism and indeterminism in the interpretation of processes life activity. Diversity of forms of determination in living systems and their interrelation. The essence and forms of biological teleology: the phenomenon of "expediency" of the structure and functioning of living systems, purposefulness How a fundamental feature of the basic life processes, functional descriptions And explanations in the structure of biological knowledge.	OK
	Topic 9.8. Impact biology on the formation of new norms, attitudes and orientations of culture. Philosophy of life in the new paradigm of culture. The impact of modern biological research on the formation of new ontological explanatory schemes, methodological and epistemological guidelines, value orientations and activity priorities in the cultural system. The need to create a new philosophy of nature that studies the patterns of functioning and interaction of various ontological explanatory schemes and models presented in modern science. The role of biology in the formation of general cultural cognitive models of integrity, development, systemicity, co-evolution . Historical prerequisites formation of bioethics. Bioethics V various cultural contexts. Main principles And rules of modern biomedical ethics. Social, ethical, legal and philosophical problems applications biological knowledge. The value of life in various cultural and confessional discourses. Historical and theoretical prerequisites for the biological interpretation of power relations. Ethological and sociobiological grounds modern biopolitical concepts. The main patterns of sociable behavior in the world of living organisms and in human society. Problems of power and power relations V biopolitical perspective. Social and philosophical analysis problems of biotechnology, genetic and cellular engineering, cloning.	OK

	Topic 9.9. The subject of ecophilosophy . Ecophilosophy as a field of philosophical knowledge, exploring philosophical problems of interaction of living organisms and systems with each other and their environment. Formation ecology V view integrated scientific discipline: from biological ecology to human ecology, social ecology, global ecology. Transformation ecological problems into the dominant ideological attitude of modern culture. Ecophilosophy How reflection over problems of the human environment, changes in attitudes towards human existence, transformation public mechanisms.	LK, SZ
	Topic 9.10. Man and nature in the socio-cultural dimension. Main historical stages interactions society and nature. Genesis of environmental issues. Ecophilic and ecophobic motives mythological consciousness. Ancient ecological thought. Ecological views of the Middle Ages and the Renaissance. Ecological views eras Enlightenment. Ecological ideas of the New Time. Darwinism and ecology. The doctrine of the noosphere by V. I. Vernadsky. New ecological accents of the 20th century: urban ecology , growth limits, sustainable development. Modern ideas about the need new world order as a way to solve global problems of our time And provision transition to the strategy of sustainable development. Historical conditionality the emergence of social ecology. The main stages of development of social-ecological knowledge. The subject and tasks of social ecology, the structure socio-ecological knowledge and its relationship with other sciences. Specificity socio-ecological laws of social development, their relationship with traditional social laws. Social ecology as a theoretical basis overcoming ecological crisis.	OK
	Topic 9.11. Ecological foundations of economic activity. Specifics of human economic activity in the process nature management, her main stages. Features of economic activity taking into account the prospect of finiteness of the planet's material resources. Main directions of transformation of the production and consumer spheres of society With purpose overcoming environmental challenges. Directions for changing the system of priorities And valuable landmarks people in conditions ecological crisis situations. Ways to overcome the finiteness of material resources at simultaneously progressive development society.	OK
	Topic 9.12. Ecological imperatives of modern culture. Modern ecological crisis as a civilizational crisis: origins and trends. Directions changes biospheres V process of scientific and technological revolution. Principles of interaction between society and nature. Ways of formation ecological culture. Spiritual and historical foundations for overcoming the ecological crisis. Ethical prerequisites for solving environmental problems. Ecology and ecopolitics . Ecology and law. Ecology and economics. Concept sustainable development in the context of globalization. Ecology and philosophy of information civilization. Critical analysis of the main scenarios of eco-development humanity: anthropocentrism, technocentrism ,	LK, SZ

	biocentrism , theocentrism , cosmocentrism , eccentricity . Change of dominant regulators cultures and the formation of new constitutive principles under the influence of ecological imperatives. A new philosophy of interaction between man and nature in the context of concepts sustainable development of Russia.	
	Topic 9.13. Education, upbringing and enlightenment in light of environmental problems of humanity. Role education And education in the process of personality formation. Features of environmental education and training. The need to change the worldview paradigms How the most important condition for overcoming environmental hazards. Scientific foundations of environmental education. Features of the philosophical program " Paideia " in the context of an environmental crisis. Practical importance of environmental knowledge for preventing dangerous destructive processes V nature And society. Role mass media in the field of environmental education, upbringing and enlightenment of the population.	OK

5. LOGISTIC AND TECHNICAL SUPPORT OF DISCIPLINE

Audience type	Equipping the auditorium	Specialized educational/laboratory equipment, software and materials
Lecture	lecture- type classes , equipped with a set of specialized furniture; a board (screen) and technical means of multimedia presentations	No
Seminar	An auditorium for conducting seminar-type classes, group and individual consultations, ongoing monitoring and midterm assessment, equipped with a set of specialized furniture and technical means for multimedia presentations	No
For independent work of students	A classroom for independent work of students (can be used for conducting seminars and consultations), equipped with a set of specialized furniture and computers with access to the EIS	No

6. EDUCATIONAL, METHODOLOGICAL AND INFORMATIONAL SUPPORT OF THE DISCIPLINE

Main literature:

Stepin V. S. Philosophy and Methodology of Science. Selected [Text/electronic resource] / V. S. Stepin. – Electronic text data. – M.: Academic project: Alma Mater, 2015. - 716 p. - (Philosophical technologies: Selected philosophical works). http://lib.rudn.ru/ProtectedView/Book/ViewBook/6753

Markhinin V. V. Lectures on the Philosophy of Science [Electronic resource]: Textbook / V. V. Markhinin . - M.: University Book, 2016. - 428 p. http://lib.rudn.ru/ProtectedView/Book/ViewBook/6068

Further reading:

History and Philosophy of Science (Philosophical Sciences) [Text/electronic resource]: Study guide for preparation for the candidate exam / Comp. S.A. Lokhov ; Ed. V.M. Naidysh . - Electronic text data. - Moscow: RUDN University Press, 2013. - 95 p. - http://lib.rudn.ru/ProtectedView/Book/ViewBook/3932

Resources of the information and telecommunications network "Internet":

RUDN University Electronic Library System and third-party electronic library systems to which university students have access on the basis of concluded agreements:

– Electronic library system of RUDN: [site]. URL: http://lib.rudn.ru/MegaPro/Web
– Electronic library system "University Library Online": [website]. URL: http://www.biblioclub.ru/
– Educational platform " Urait " : [website] . URL : https://urait.ru/
– Electronic Library System "Lan": [site]. URL : https :// e . lanbook . com /
– Educational platform " Urait " : [website] . URL : https://urait.ru/

Databases and search engines:

– Cambridge Dictionary: [website]. URL: https://dictionary.cambridge.org/ru/
– Oxford Learner's Dictionaries: [website]. URL: https://www.oxfordlearnersdictionaries.com/
– Search engine "Yandex": [site]. URL : https :// yandex . ru /
– Search engine « Google »: [site]. URL : https :// www . google . com /

Educational and methodological materials for independent work of students in mastering a discipline/module:

Methodological guidelines for preparation for the candidate examination in a foreign language.

7. EVALUATION MATERIALS AND SCORE-RATING SYSTEM FOR ASSESSING THE LEVEL OF DEVELOPMENT OF COMPETENCES IN THE DISCIPLINE

Assessment materials and the point -rating system for assessing the mastery of the discipline are presented in the appendix to this work program of the discipline.

DEVELOPERS:

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HEAD OF THE BUP

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