**Federal State Autonomous Educational Institution of Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA named after Patrice Lumumba
RUDN University**

Faculty of Science

educational division (faculty/institute/academy) as higher education programme developer

COURSE SYLLABUS

History and philosophy of science
course title

Recommended by the Didactic Council for the Education Field of:

04.04.01 «Chemistry»
field of studies / speciality code and title

The course instruction is implemented within the professional education programme of higher education:

«Bioenergies and Biorefineries»

higher education programme profile/specialisation title

2024

1. COURSE GOAL

The goal of the course "History and philosophy of science" is to form students' understanding of modern philosophy of science as a system of scientific knowledge of a special type, including the main ideological and methodological problems in their rational and theoretical understanding. The main aspects include the study of the evolution and development of scientific thinking, the analysis of various scientific approaches and methodologies. Master's students explore historical moments, the contribution of individual scientists and scientific schools to the formation of science, as well as study the ethical and social aspects of scientific activity.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course "History and philosophy of science" is aimed at the development of the following competences:

Table 2.1. List of competences that students acquire through the course study

Competence code	Competence descriptor	Competence formation indicators (within this course)
GC-1	Ability to carry out critical analysis of problem tasks applying a systematic approach, to develop an action strategy.	GC-1.1. Ability to analyze the problem task as a system, identifying its components and relationships between them.
		GC-1.2. Ability to identify lack in information needed to solve a problem task and to design processes to address them;
		GC-1.3. Ability to critically evaluate the reliability of information sources, to work with conflicting information from different sources
		GC-1.4 Ability to develop and substantively argue a strategy for solving a problem situation based on a systematic and interdisciplinary approach
		GC-1.5 Ability to use logical and methodological tools for a critical assessment of modern concepts of a philosophical and social nature in its subject area
GC-5	Ability to analyze and perceive the diversity of cultures in the process of intercultural interaction.	GC-5.1. Ability to analyze the most important ideological and value systems formed in the course of historical development; substantiates the relevance of their use in social and professional interaction;
		GC-5.2. Ability to build social and professional interaction, taking into account the characteristics of the main forms of scientific and religious consciousness, business and general culture of representatives of other ethnic groups and confessions, various social groups;
		GC-5.3. Ability to ensure the creation of a non-discriminatory environment for interaction when performing professional tasks

Competence code	Competence descriptor	Competence formation indicators (within this course)
GC-6	Ability to identify and implement the priorities of their own activities and self-development based on self-assessment.	GC-6.1. Ability to evaluate their resources and their limits (personal, situational, temporary), optimally use them for the successful completion of the assigned task;
		GC-6.2. Ability to determine the priorities of professional growth and ways to improve their own activities based on self-assessment according to the selected criteria;
		GC-6.3. Ability to build a flexible professional trajectory using the tools of continuing education, taking into account the accumulated experience of professional activity and dynamically changing requirements of the labor market
GPC-2	Ability to analyze, interpret and generalize the results of experimental and computational-theoretical work in the chosen field of chemistry or related sciences.	GPC-2.1. Ability to carry out a critical analysis of the results of own experimental and computational-theoretical works and to interpret them correctly;
		GPC-2.2. Ability to formulate summary and conclusions based on the results of the analysis of literature data, own experimental and computational-theoretical works in the chosen field of chemistry or related sciences

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course "History and philosophy of science" refers to the **core** component of B1 block of the higher educational programme curriculum.

Within the higher education programme students also master other (modules) and / or internships that contribute to the achievement of the expected learning outcomes as results of the course study.

Table 3.1. The list of the higher education programme components/disciplines that contribute to the achievement of the expected learning outcomes as the course study results

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
GC-1	Ability to carry out critical analysis of problem tasks applying a systematic approach, to develop an action strategy.	Actual problems of modern chemistry Psychology of management	Student Scientific- Research work Pre-graduation practical training
GC-5	Ability to analyze and perceive the diversity of cultures in the process of intercultural interaction.	Psychology of management Foreign language in professional activity Russian Language in Professional Activities	Pre-graduation practical training
GC-6	Ability to identify and	Actual problems of	Student Scientific- Research

Compete nce code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
	implement the priorities of their own activities and self-development based on self-assessment.	modern chemistry Psychology of management Higher education pedagogy	work Teaching practical training Pre-graduation practical training
GPC-2	Ability to analyze, interpret and generalize the results of experimental and computational-theoretical work in the chosen field of chemistry or related sciences.	Actual problems of modern chemistry Bioenergy Modern organic synthesis and pharmacology Alternative / new tools for organic synthesis Bioproducts and Biorefineries Advanced Organic Synthesis	Student Scientific- Research work Pre-graduation practical training

* To be filled in according to the competence matrix of the higher education programme.

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

1)The total workload of the course "History and philosophy of science" is 2 credits (72 academic hours).

*Table 4.1. Types of academic activities during the periods of higher education programme mastering (**full-time training**)**

Type of academic activities	Total academic hours	Semesters/training modules			
		1	2	3	4
Contact academic hours	36			*18*	*16*
including:					
Lectures (LC)	17			9	8
Lab work (LW)					
Seminars (workshops/tutorials) (S)	17			9	8
Self-studies	*29*			*18*	*11*
Evaluation and assessment (exam/passing/failing grade)	*9*				*9*
Course workload	academic hours	**72**			**36**	**36**
	credits	**2**			**1**	**1**

5. COURSE MODULES AND CONTENTS

Table 5.1. Course contents and academic activities types

Course module title	Course module contents (topics)	Academic activities types
Module 1. Subject area and history of science	Topic 1.1. The subject area of the philosophy of science. Science in the culture of modern	LC, S

Course module title	Course module contents (topics)	Academic activities types
	civilization. Science as a cognitive activity, social institution and cultural sphere.	
	Topic 1.2. The emergence of science and the main stages of its historical evolution are Pre-science and science.	LC, S
	Topic 1.3. The emergence of science and the main stages of its historical evolution are the features of the intellectual atmosphere of the Middle Ages.	LC, S
	Topic 1.4. The emergence of science and the main stages of its historical evolution The Positivist tradition in the philosophy of science (classical positivism and empiricism).	LC, S
	Topic 1.5. The structure of scientific knowledge. Scientific knowledge as a complex developing system. Empirical and theoretical levels, their features and differences.	LC, S
Module 2. Problems of the dynamics of scientific knowledge development	Topic 2.1. The dynamics of science as a process of generating new knowledge is the historical variability of the mechanisms of generating scientific knowledge.	LC, S
	Topic 2.2. Methodology of scientific research Method and methodology. Classification of methods. The main models of the relationship between philosophy and private sciences.	LC, S
	Topic 2.3. Scientific traditions and scientific revolutions. Types of scientific rationality The problem of scientific traditions. The diversity of scientific traditions.	LC, S
	Topic 2.4 Features of the modern stage of science development. The main characteristics of modern post-nonclassical science.	LC, S
	Topic 2.5 Social and humanitarian sciences: formation, features, methodology.	LC, S
Module 3. Philosophical problems of branches of scientific knowledge	Topic 3.1 Philosophical problems of natural science Natural science in the cultural system. The evolution of the scientific picture of the world and its historical forms.	LC, S
	Topic 3.2 The philosophy of engineering and technology The historical development of the meanings of the concept of "technology". The main stages of the evolution of technology from ancient times to the present day.	LC, S
	Topic 3.3 Science as a social institution. Science as a sociocultural phenomenon.	LC, S
	Topic 3.4 Features of the development of	LC, S

Course module title	Course module contents (topics)	Academic activities types
	scientific knowledge among Kazakhs. Traditional Kazakh worldview and science	
	Topic 3.5 The ethos of science. The value nature of science as a prerequisite for its understanding.	LC, S

* - to be filled in only for **full** -time training: *LC - lectures; LW - lab work; S - seminars.*

6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. Classroom equipment and technology support requirements

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
Lecture	A lecture hall for lecture-type classes, equipped with a set of specialised furniture; board (screen) and a set of devices for multimedia presentations.	Projector, motorized screen for projectors, wi-fi
Seminar	A classroom for conducting seminars, group and individual consultations, current and mid-term assessment; equipped with a set of specialised furniture and technical means for multimedia presentations.	- portable multimedia projector Epson EB-X04 - portable laptop Irbis NB25 - - portable TV Tosiba LSDTV/DVD Combo 22DV703R - tables, chairs, blackboard.
Self-studies	A classroom for self-studies (can be used for seminars and consultations), equipped with a set of specialised furniture and computers with access to the electronic information and educational environment.	**Faculty of Science Reading Room** Ordzhonikidze D.3. Coworking area Monday - Friday 10.00 – 22.00 **Reading room of the main building of the RUDN** Coworking area Monday - Saturday 9.00 - 23.00 Hall No. 2 Monday - Thursday 10.00 - 17.45 Friday 10.00 - 16.45 Hall No. 6 Monday - Thursday 10.00 - 17.45 Friday 10.00 - 16.45

* The premises for students' self-studies are subject to **MANDATORY** mention

7. RECOMMENDED RESOURCES FOR COURSE STUDY

Main literature:

1. Franz-Peter Griesmaier, Jeffrey A. Lockwood. This is Philosophy of Science: An Introduction, 2022
2. Christopher Donohue and Charles T. Wolfe. Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy (History, Philosophy and Theory of the Life Sciences, 29): 2022

Additional literature:
1. Ostrovsky E.V. (2012) History and Philosophy of Science. UNITY-DANA, 160 p.
2. Cover J.A., Curd M. and Pincock, C. (2012) Philosophy of Science: The Central Issues, 2nd edition. Norton.

Internet sources
1. Electronic libraries with access for RUDN students:
- RUDN Electronic Library System (RUDN ELS) http://lib.rudn.ru/MegaPro/Web
- EL "University Library Online" http://www.biblioclub.ru
- EL "Yurayt" http://www.biblio-online.ru
- EL "Student Consultant" www.studentlibrary.ru
- EL "Lan" http://e.lanbook.com/
- EL "Trinity Bridge"
- ……….
Databases and search engines:
- electronic foundation of legal and normative-technical documentation http://docs.cntd.ru/
- Yandex search engine https:// www .yandex.ru/
- Google search engine https://www.google.ru/
- Scopus abstract database http://www.elsevierscience.ru/products/scopus/

Training toolkit for self- studies to master the course *:

1. The laboratory workshop

* The training toolkit for self- studies to master the course is placed on the course page in the university telecommunication training and information system under the set procedure.

8. ASSESSMENT TOOLKIT AND GRADING SYSTEM* FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL UPON COURSE COMPLETION

The assessment toolkit and the grading system* to evaluate the competences formation level (competences in part) upon the course study completion are specified in the Appendix to the course syllabus.

* The assessment toolkit and the grading system are formed on the basis of the requirements of the relevant local normative act of RUDN University (regulations / order).

DEVELOPERS:

Associate Professor of the **Department of Philosophy**		**Mamyrbekova A.K.**
position, department	signature	name and surname

HEAD OF EDUCATIONAL DEPARTMENT:

Organic Chemistry Department		**Voskressensky L.G.**
name of department	signature	name and surname

HEAD OF HIGHER EDUCATION PROGRAMME:

Dean of Faculty of Science, **Head of Organic Chemistry** **Department**		**Voskressensky L.G**
position, department	signature	name and surname