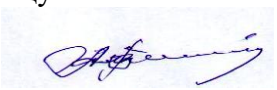
Volodymyr Vynnychenko Central Ukrainian State Pedagogical University

Department of Philosophy, Political Science and Psychology

«ЗАТВЕРДЖУЮ»
В.о. завідувача кафедри
К.п.н., професор Рацул А. Б.



«2» серпня 2022 року

WORK PROGRAM OF THE DISCIPLINE

Philosophy of Scientific Knowledge

Faculties: all faculties.
Form of education: full-time / part-time

Kropyvnytskyi – 2022-2023

WORK PROGRAM OF THE DISCIPLINE: **Philosophy of Scientific Knowledge for masters**

Developer: Doctor of Philosophical Sciences, Professor of the Department of Philosophy, Political Science and Psychology Kharchenko Y.V.

Work program approved at the meeting of the Department of Philosophy, Political Science and Psychology of Volodymyr Vynnychenko Central Ukrainian State Pedagogical University

Protocol of "5" August 2022 № 1

Head of the Department: professor Kharchenko Y.V.

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1. Description of the discipline

<table>
<tr><td rowspan="2">Name of indicators</td><td rowspan="2">Field of knowledge, field of study, educational qualification level</td><td>Characteristics of the discipline</td></tr>
<tr><td><u>Full-time / part-time form</u></td></tr>
<tr><td rowspan="3">Кількість кредитів – 3</td><td>Field of study: all fields</td><td rowspan="2"><u>Normative</u></td></tr>
<tr><td>Specialties: all specialties</td></tr>
<tr><td>Lectures
20 h/ 6 h</td></tr>
<tr><td>Total number of hours – 90</td><td rowspan="6">Second (Master's) level of higher education</td><td>Practical, seminars:
14 hours/4 hours</td></tr>
<tr><td rowspan="5">Classroom - 34
Independent work of the student – 56</td><td>Consultations:
10 hours/4 hours</td></tr>
<tr><td>Independent work:
56 h/80 h</td></tr>
<tr><td>Individual tasks:
0 hrs.</td></tr>
<tr><td>A form of control:
credit</td></tr>
</table>

2. The purpose and objectives of the discipline

The purpose of the discipline "Philosophy of Scientific Knowledge" is to identify the specifics of intellectual activity in a new type of society (multidimensional) that is being formed.

Objectives:

- To show that scientific knowledge both in ancient times and throughout the history of mankind, and in modern conditions is not only a special practice, but also the highest sphere of intellectual creativity;
- To promote the understanding that scientific knowledge is significant both in everyday life and in all other social spheres, because it contributes to the improvement of technology;
- To encourage students to thorough analysis, to develop scientific reflection;
- To prove that the application of scientific methods and knowledge can help everyone to become a professional in any field of activity;
- To develop a conscious attitude to information, to develop a scientific approach to its selection, taking into account that in modern conditions the quantity of information levels its quality, and the main dominants of social life are: mystification, distortion of facts, mass, stereotypical thinking, information violence, inflation of the word, etc.

As a result of studying the discipline, the student must

know:

- conceptual and categorical apparatus of the philosophy of scientific knowledge;
- subject, method, functions of philosophy of scientific knowledge;
- features and key aspects of epistemology, methodology, logic;

be able to:

- competently apply the conceptual and categorical apparatus;
- formulate and analyze a scientific problem, apply methods of scientific knowledge, distinguish between basic methodological principles and approaches, form a special culture of thinking;

understand what it is:

- ✓ ability to reflect;
- ✓ development of creative approaches to problem solving;
- ✓ heuristic way of thinking;
- ✓ understanding the value of theoretical and experimental science;
- ✓ innovative approach to the choice of fundamental philosophical methodological principles;
- ✓ understanding of universal small and large laws of dialectics, laws of nature;
- ✓ effective selection of methodological classifications, scientific-theoretical and scientific-practical methods;
- ✓ selection of special methodology;
- ✓ understanding of the structure of scientific knowledge.

Formed competencies:

IC Ability to solve complex theoretical and practical tasks and problems during professional activity or in the process of study, which involves research and innovation and is characterized by uncertainty of conditions and requirements.

GC1 Ability to conduct research at the appropriate level.

GC2 Ability to learn and master modern knowledge.

GC3 Ability to identify, pose and solve problems.

GC4 Ability to communicate in a foreign language.

GC5 Ability to generate new ideas (creativity).

GC8 Ability to show initiative and entrepreneurship.

GC9 Ability to evaluate and ensure the quality of work performed.

SC6 Ability to use theoretical and methodological approaches of science, interdisciplinary research for research.

SC7 Ability to carry out applied analytical research of problems, professionally prepare analytical materials and references.

SC10 Ability to self-study, maintain an appropriate level of knowledge.

The program learning outcomes correspond to the components of the educational program:

PLO 3 Apply modern scientific approaches, methodologies and techniques to research problems

PLO 7 Evaluate and analyze problems and situations, propose new approaches

*PLO **14** Evaluate the results of own work and be responsible for personal professional development*

3. The program of the discipline

Introduction. The study of the course "Philosophy of Scientific Knowledge" is an important factor in the intellectual and spiritual development of students, the formation of students' ability to adequately understand and solve theoretical, methodological, worldview problems of modern science.

The proposed program is designed to provide students with a holistic presentation of the main problems of the philosophy of scientific knowledge at the level of an objective, ideologically unbiased modern vision of the problems of modern science. At the same time, the program is designed to acquaint students with the existing variety of modern scientific and philosophical concepts in order to reveal the polyphony and pluralism of scientific and philosophical thinking, to provide an opportunity for their alternative perception. The course is designed to synthesize the acquired knowledge of

professional and humanitarian disciplines into a holistic worldview in order to create the basis for the methodological and humanitarian components of the master's level of training.

LECTURES

Topic: Philosophy of scientific knowledge and the range of its problems.

1. The essence of the philosophy of scientific knowledge.
2. Subject, tasks, functions of the philosophy of scientific knowledge.
3. Cybernetics, genetics, biology in the context of the formation of a new scientific paradigm and its assessment by the philosophy of scientific knowledge.
4. Levels of scientific knowledge: empirical and theoretical. Unity of empirical and theoretical, theory and practice. The problem of materialization (objectification) of theory. Conditions of materialization of theory.

Topic: Influence of the philosophy of scientific knowledge on the formation of the scientific picture of the world.

1. The worldview significance of the scientific picture of the world.
2. The problem of the scientific picture of the world in the context of history.
3. Mechanistic picture of the world and its theoretical and socio-cultural consequences. Electrodynamic picture of the world. Quantum-relativistic picture of the world and its philosophical foundations.
4. Contradiction between epistemological and ontological foundations of the quantum-relativistic picture of the world.
5. Ideas of cosmism (K.Tsiolkovsky, A.Chizhevsky) and their importance for the formation of the modern scientific picture of the world. Vernadsky's noospheric ideas. Passionarity and co-evolution as topical issues of philosophy of science of the XXI century (L. Gumilev).

Topic: Reductionism. Synergies: their possibilities and limits.

1. Phenomenology and its role. The concept of "phenomenological reduction".
2. Synergetics as a new worldview. Destruction of the usual ideas about the world. Chaos as a creative principle.
3. Regularity and randomness. Ways of development of complex systems. Mechanism of localization (emergence of structures and their evolution).
4. Principles of operation and control of complex systems.
5. Synergetics as a way to reveal the patterns and conditions of rapid avalanche-like processes and processes of nonlinear self-stimulating growth.

Topic: Rationality as a way of relating to the world.

1. Structure and typology of rationality. The diversity of forms of rationality.
2. Classical and non-classical rationality: mind and culture. Determinants of the development of scientific rationality.
3. Historical types of scientific rationality. Global scientific revolutions and changes in historical types of scientific rationality. The classical ideal of rationality and its embodiment in the historical type of rationality of classical science. Revealing the limitations of the classical ideal of rationality during the scientific revolution of the early twentieth century.
4. Non-classical and post-non-classical scientific rationality.

Topic: Scientific cognition as a sphere of creativity. The meaning of activity and moral responsibility of a scientific researcher. Paradoxicality of knowledge.

1. Entering the field of scientific activity. Identification of scientific directions that determine the nature of the scientist's activity.

2. Search for scientific problems. Identification of patterns of scientific cognition associated with the repeatability of phenomena.
3. Observation, experiment, analysis. Justification of conclusions.
4. The concept of "knowledge". The value of knowledge. "Knowledge" and "ignorance".

Topic: The doctrine of scientific traditions (T. Kuhn, I. Lakatos). Limitations of scientific traditions.

1. Innovations in science: creation of new theories; emergence of new disciplines.
2. Place of innovations in: setting new problems; building a new classification or periodization; development of new experimental research methods.
3. Scientific revolutions as types of innovations. The contradictory nature of the mutual influence of innovations and revolutions. Scientific revolutions as ways of restructuring scientific traditions and as forms of transformation of worldview and methodological foundations of science, styles of thinking.
4. Specifically scientific and general scientific revolutions. Special scientific and general scientific aspects of the revolution.

4. Structure of the discipline

Name the topics	Number of hours					
	Total	Including				
		L	P	L	I	Ind.
1	2	3	4	5	6	7
Theoretical part						
1. The main problems of the philosophy of scientific knowledge.						
Topic 1: Philosophy of scientific knowledge and the range of its problems.		4/1	2/1			10/20
Topic 2: Influence of the philosophy of scientific knowledge on the formation of the scientific picture of the world.		4/1	2/1			10/20
Topic 3: Reductionism. Synergies: their possibilities and limits.		4/1	2/1			10/20
2. Formation of key principles of philosophy of scientific knowledge.						
Topic 4: Rationality as a way of relating to the world.		4/1	2/1			10/10
Topic 5: Scientific cognition as a sphere of creativity. The meaning of activity and moral responsibility of a scientific researcher. Paradoxicality of knowledge.		2/1	4			10/5
3. Prospects of philosophy of scientific knowledge.						
Topic 6: The doctrine of scientific traditions (T. Kuhn, I. Lakatos). Limitations of scientific traditions.		2/1	2			6/5
Hours in total:	**90**	**20/6**	**14/4**			**56/80**

5. Topics of seminars

№	Topic title	Number of hours
1. Theory and practice in the philosophy of scientific knowledge.		
1.	***Topic: Specificity of theoretical cognition and its forms.*** 1. Correlation of rational and irrational, intuitive and discursive (logical) sides of cognition. 2. Structural components of theoretical knowledge: problem, hypothesis, theory, law. Law as a key element of scientific theory. Classification of laws. 3. Structure and functions of scientific theory. The main elements of the structure of the theory: the initial foundations (fundamental concepts, principles, laws, equations, axioms), idealized object, logic of the theory, philosophical guidelines, socio-cultural and value factors, a set of laws and statements derived as consequences from the fundamentals.	6/1
2. The place of scientific theory in the philosophy of scientific knowledge.		
2.	***Topic: Specificity and structure of scientific theories. The main types of theories.*** 1. Empiricism and scholastic theorizing. Methods and means of empirical research: description, comparison, measurement, observation, experiment, analysis, induction. 2. Fact as the most important element of empirical research. Factualism and theorism in understanding the nature of fact. Empirical generalizations.	6/1
3. The role of classical and non-classical science in the context of the formation of philosophy of scientific knowledge.		
3.	***Topic: Causality and necessity in classical and non-classical philosophy of scientific knowledge.*** 1. Laplace determinism and dynamic laws. 2. Probabilistic causality in non-classical philosophical science: statistical laws as a connection between the necessary and the accidental. 3. The problem of finiteness and infinity of space and time in the context of cosmological ideas: classical (Newton), relativistic (Einstein, Friedman), modern (Weinberg, Linde). The problem of time irreversibility in classical and non-classical physics.	2/2
TOTAL is approximate:		**14/4 hours**

6. Independent work

№	Topic title	Number of hours
1. Problems and prospects of philosophy of scientific knowledge.		
1.	***Topic: Epistemological characteristics of scientific rationality.*** 1. The idea of objectivism in traditional epistemology. Criticism of Objectivism by philosophers of phenomenological and analytical directions. 2. Subjective and communicative rationality. Truth and values.	56/80

	3. Rationality in cognitive and social systems. Socio-cultural and existential preconditions of the crisis of scientific rationality. 4. Science as a form of domination and alienation factor. The problem of establishing a connection between scientific knowledge and the human world. 5. Scientific rationality and technology. Technification and the world of life. Rationalist project of modernity and its criticism. 6. Modern philosophy of scientific knowledge on the way to a new understanding of scientific rationality.	
TOTAL is approximate:		**56/80 hours**

7. Individual tasks

Not provided

8. Teaching methods

The main forms of the educational process in the study of the discipline "Philosophy of Scientific Knowledge":

- training sessions;
- independent work of students;
- work in the scientific library of V. Vynnychenko Central State Pedagogical University and the Internet;
- control measures.

Types of academic work of students:

- lecture with the use of structural and logical diagrams;
- seminar lesson;
- consultation;
- credit.

In the process of studying the discipline "Philosophy of Scientific Knowledge " the following teaching methods are used:

By the type of cognitive activity:

- explanatory and illustrative;
- reproductive;
- problematic presentation;
- exploratory;
- according to the logic of knowledge:
- analytical;
- inductive;
- deductive;

By the main stages of the process:

- formation of knowledge;
- formation of skills and abilities;
- application of knowledge;
- generalization;
- consolidation;
- checking;

By a systematic approach:

- stimulation and motivation;
- control and self-control;

By sources of knowledge:

- verbal - story, explanation, lecture;
- visual - demonstration, illustration;
- verbal - story, explanation, lecture;
- visual - demonstration, illustration;
- verbal - story, explanation, lecture;
- visual - demonstration, illustration;

By the level of independent mental activity:

- problematic;
- partially searching;
- exploratory;
- method of problem-based teaching.

9. Control methods

Evaluation of the quality of students' knowledge in the organization of the educational process is carried out by current, final (semester) control on a 100-point grading scale, according to the ECTS scale and the national grading scale.

9.1. CURRENT CONTROL

Current control is an assessment of the student's academic achievements (level of theoretical knowledge and practical skills on the topics of the discipline) during classroom classes, organization of independent work, consultations (during the work of missed classes or if you want to improve the previous grade) and student activity in the classroom.

Current control is implemented in the form of surveys, speeches at seminars, express control, control of mastering the educational material planned for independent study by the student, etc.

Forms of student participation in the educational process, which are subject to current control:

- speech on the main issue;
- oral report;
- additions, questions to the speaker, review of the speech;
- participation in discussions, interactive forms of class organization.
- analysis of source and monographic literature;
- written assignments (tests, quizzes, creative works, essays, etc.);
- independent study of topics;
- preparation of theses, abstracts of educational or scientific texts;
- systematic work in seminars, activity during the discussion of issues.

The evaluation criteria are:

oral answers:

- completeness of the issue disclosure;
- logic of teaching, culture of language;
- emotionality and conviction;
- use of basic and additional literature;
- analytical reasoning, ability to make comparisons, conclusions;

completion of written tasks:

- completeness of disclosure of the issue;
- integrity, consistency, logic, ability to formulate conclusions;
- accuracy of written work.

The maximum score for a presentation on a particular module topic ***at a seminar class is 5 points:***

- ***5-4 points*** is assigned when the student has fully mastered the theoretical material, logically presents it, connecting it with what was learned earlier, sees interdisciplinary connections,

gives arguments, makes references to the necessary literature. It is obligatory to get acquainted with additional literature, its processing and use during the disclosure of the issue. The student draws conclusions, expresses hypotheses, discusses.

- ***2.5-3 points*** is assigned when the student has mastered the theoretical material, freely presents it, gives examples, but there are minor problems with understanding the systemic connections, commenting on the theoretical material. The logic of presentation is not always followed, minor mistakes or inaccuracies are made.
- ***1.5-2 points*** are assigned to a student who has mastered the material at the level of retelling, reproduces what he has learned not always logically, makes mistakes.
- ***0.5-1 points*** is given to a student who retells the material uncertainly, not always skillfully illustrating it. Needs help during the answer, makes mistakes.

Up to 15 points a student can receive for completed tasks of independent work on a particular topic of the module, taking into account the quality, completeness of the task.

Up to 5 points are given to a student who makes successful additions during seminars on a particular topic of the module, corrects inaccuracies, but does not speak individually on individual issues;

Up to 20 points are given to a student who has prepared a significant amount and content of notes for seminars on a particular topic of the module;

10 points are given to a student who worked diligently during the class, performed exercises, participated in collective discussions, etc.

If a student has never answered at seminars, he will have 0 points for the corresponding current control.

By the decision of the department, students who participated in research work - the work of conferences, student scientific circles and problem groups, preparation of publications, were participants in Olympiads, competitions, etc. may be awarded additional points: ***up to 25 points.***

35 points a student can get for presence and fruitful work at the lecture and seminar.

A student who did not attend classes (for valid reasons documented), and therefore did not have current grades, has the right to re-pass the current control during consultations. During consultations, students can work out missed seminars, defend essays, as well as eliminate debts from other types of academic work.

Two control works in the form of four-level tasks are provided based on the results of studying the topics of module 1 and module 2.

The duration of the control tasks should not exceed two academic hours.

All students are allowed to take tests regardless of the results of the current control.

To conduct control works, control tasks of two options have been developed, which are equivalent in terms of labor intensity.

For completing the control works, the student receives points that are taken into account in the process of calculating the final semester grade:

- maximum number of points - ***40 (1st work), 30 (2nd work).***

In the process of performing control tasks, the student can use only those auxiliary materials that are determined by the teacher. The student is forbidden to exchange information with other students in any form and use materials other than those allowed. If a student violates the established rules for performing control tasks, the teacher deprives the student of the opportunity to continue performing control tasks, does not check the work, makes an appropriate record on it and evaluates it with zero points. The results of the control measure of the student who did not appear on it are also evaluated with zero points regardless of the reason.

The results of control works are brought to the attention of students no later than two working days after their execution.

Retaking of control works is allowed in the terms determined by the teacher, during the current consultations.

9.2. FINAL (SEMESTER) CONTROL

The discipline "Philosophy of Scientific Knowledge" provides such a form of semester control as a test, which is held at the end of the semester.

The total number of points in the discipline (maximum 100 points) is determined as the sum of the points of the current control. The credit is given based on the results of the student's work throughout the semester.

For all students who have fully completed the curriculum and are positively certified in this discipline (scored at least 60% of 100 points), the total result of semester control in points and a two-level scale of "passed", "failed", according to the ECTS scale is entered in the Student's Record of Progress, Student's Record Book. The completed and executed academic record is returned to the dean's office within a specified period of time personally by the teacher.

In case of receiving less than 60 points (FX, F) according to the results of semester control, the student must retake the exam to eliminate academic debt.

10. GRADING SCALE: NATIONAL AND ECTS

Discipline "Philosophy of scientific knowledge"

Sum of points for all types of learning activities	Score ECTS	Score on the national scale	
		for the exam	***for credit***
90 – 100	**A**	excellently	credited
82-89	**B**	good	
74-81	**C**		
64-73	**D**	satisfactorily	
60-63	**E**		
35-59	**FX**	unsatisfactory with the possibility of retaking	not credited with the possibility of retaking
0-34	**F**	unsatisfactory with mandatory re-study of the discipline	not credited with mandatory re-study of the discipline

11. Methodological support

1. Work program and power of beads in the discipline "Philosophy of Scientific Knowledge".
2. Texts of lectures (in electronic version).

12. Recommended literature

1. Багдасарьян, Н.Г. История, философия и методология науки и техники: Учебник и практикум для бакалавриата и магистратуры / Н.Г. Багдасарьян, В.Г. Горохов, А.П. Назаретян. - Люберцы: Юрайт, 2016. - 383 с.
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