



SYLLABUS "METHODOLOGY OF SCIENTIFIC"

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Department responsible for the course or equivalent: *Institute of Management in Economic, Ecological and Social Systems; Department of Philosophy*

Semester when the course unit is delivered: *1st*

Level of course unit: *master level*

ECTS credits: *6*

COURSE OBJECTIVES (AIMS)

The goal of the discipline «**Methodology of scientific**» is to develop students' knowledge, skills, and abilities in predicting and designing trends in the development of scientific research, conducting research work through the introduction of scientific research methodology.

Objectives:

- to form a detailed understanding of the modern philosophy and methodology of science among undergraduates;
- to promote the acquisition of students' understanding of the role of science in the development of civilization, the interaction of science and technology and related social, legal and ethical problems, the values of scientific rationality and its historical types, the ability to use knowledge of the structure, forms and methods of scientific knowledge;
- to form a detailed understanding of the theoretical and empirical methods of scientific research, their areas of application, the possibility of using in the preparation of a master's thesis;
- to form a detailed understanding of the terminology of scientific research;
- to form the skills of searching for scientific information in abstract databases, including the impact factor, quartile of the journal, citation of a scientist, etc., as well as searching for documentary sources of information in catalogs and file cabinets;
- to form a detailed idea of the methodology for writing a master's thesis;
- to form a detailed understanding of the methods of preparing scientific articles for leading Russian and foreign publishing houses among undergraduates.



COURSE CONTENTS

Topic 1. Science as the most important form of knowledge in the modern world. The concept of science: science as an activity, a social institution and a system of knowledge. Forms of reflexive understanding of scientific knowledge: theory of knowledge, methodology and logic of science. Problem field of the philosophy of science. Scientific and non-scientific knowledge. Criteria of scientific knowledge. The functions of science.

Topic 2. Dynamics of scientific knowledge. The problem of rationality. Types of scientific rationality. Metatheoretical level of cognition: picture of the world, style of thinking, types of rationality. Philosophical foundations of science. Values and their role in cognition. Models of the development of science. scientific revolutions. Paradigm.

Topic 3. The structure of scientific knowledge. Variety of types of scientific knowledge. The structure of the theoretical level of knowledge. Theory. The structure of the theory. The structure of the empirical level of knowledge. Correlation of empirical and theoretical knowledge, criteria for their distinction.

Topic 4. The concept of method and methodology. Methodology: definition of the concept. Classification of scientific research methods. Philosophical general scientific and private scientific methods of scientific research. Formal and content methods. Features of empirical and theoretical methods, methods of research and presentation. Qualitative and quantitative, uniquely deterministic and probabilistic methods, methods of direct and indirect cognition and their features. Objective-content, operational and praxeological aspects of scientific research methods.

Topic 5. Scientific research as a process of obtaining new scientific knowledge. The content of the research program. Definition of research technology. The concept of scientific research. Types of research. Classification of scientific research. scientific problem. Statement of the problem and its solution. A hypothesis is a theoretical stage in the study of a problem. Essence of the theory and its role in scientific research. Goals and objectives of scientific research. Subject and object of scientific research.

Topic 6. The main stages of scientific research. Presentation and defense of the results of scientific research. Stages of scientific research. Structure and logic of scientific dissertation research. Research dissertation program. Choice of topic, work plan, bibliographic search, selection of literature and factual material. Dissertation architecture. Categorical apparatus, concepts, terms, definitions, theories, concepts, their correlation. Distribution and structure of the material.

Topic 7. Ethics of science. Plagiarism in scientific research and publications and how to prevent it. Merton's concept of the ethos of science. Ethos of classical science. Ethos of non-classical science. Ethos of post-nonclassical science. Freedom of scientific research and social responsibility of a scientist. Ethics of a scientist. Definition of plagiarism. Types of plagiarism. Responsibility for plagiarism.



LEARNING OUTCOMES

Knowledge:

- worldview, philosophical and methodological foundations of scientific and project activities;
- conceptual and categorical apparatus of philosophy and methodology of scientific and project activities;
- philosophical and methodological aspects of the development of scientific knowledge;
- theoretical and empirical methods of scientific research.

Skills:

- ability to use philosophical and general scientific categories, principles, ideas and approaches in their own specialty;
- ability to assess the state of development of science and the modern social practice based on it;
- ability to acquire new research methods based on previously acquired knowledge;
- ability to analyze information, produce effective solutions;
- ability to apply research methods in scientific activity, in particular, while writing a master's thesis and scientific articles.

Learning Outcomes:

- development of a culture of philosophical and scientific research;
- ability to work with scientific literature, formulate scientific concepts, hypotheses, based on the studied literature;
- to have skills in working with philosophical and methodological sources;
- to own the skills of competent and effective search, selection, processing and use of information sources (reference books, Internet resources);
- development of responsibility for professional and scientific activities to the environment of human society.

PLANNED LEARNING ACTIVITIES AND TEACHING METHODS

Educational technologies used in reading the Methodology of Scientific course provide for the use of the following forms of classes in the educational process: lectures, seminars, presentation of reports, conferences, interviews, discussions, small group work, various forms of independent work, are also used: problem education - the formulation of problem situations and the organization of



students' independent activities to resolve them, the research method of training. These educational technologies contribute to the development of the individual creative work of the student, as well as the ability to work in a team, to develop skills in applying various forms of knowledge in various fields of activity, depending on the goals set.

Comprehensive development of student discipline involves:

- student's involvement in discussions;
- written essay;
- written abstract;
- reading and analyzing of primary sources;
- interview and testing.

ASSESSMENT METHODS AND CRITERIA

Criteria for evaluation:

Test

- Assessment of "excellent" (8-10 points) is given to a student if he/she demonstrates a deep study of the theoretical material of the lesson, actively participates in the discussion, answers questions fully, providing additional facts and examples, and is able to prove their point of view;
- Assessment of "good" (6-7 points) is given to a student if he/she gives the correct, in general, answers to all proposed questions; however, there are minor comments on the completeness and quality of the presentation;
- Assessment of "satisfactory" (3-5 points) is given to the student if he/she demonstrates an average elaboration of the theoretical material of the lesson, but does not participate in the discussion, does not answer all the questions.
- Assessment of "unsatisfactory" (less than 2 points) is given a student if he/she demonstrates a poor study of the theoretical material of the lesson, does not participate in the discussion, and is not able to answer the questions.

Essay

- Assessment of "excellent" (9-10 points) is given to the student if the essay topic is disclosed, the task set in the work is completed, the essay contains analysis and evaluation of the processed information, the logic of the narrative is sustained, a variety of material is used.



- Assessment of "good" (6-8 points) is given to the students if the claimed topic is generally disclosed, the task set in the work is completed, the essay contains analysis and evaluation of the processed information, the logic of narration is maintained, a variety of material is used, however, there are insignificant comments on the completeness and quality of the presentation of the material.
- Evaluation of "satisfactory" (3-5 points) is given to the students if there are significant deviations from the requirements for writing an essay in their works. In particular, the topic is only partially covered; actual errors in the content of the essay; there are no conclusions in the work.
- Evaluation of "unsatisfactory" (less than 2 points) is given to the students if their essay topic does not match, reveal a significant lack of understanding of the problem, arguments are scattered, inconsistent, many dubious or erroneous facts, the text is untidy and hard to read, a lot of grammatical and spelling errors.

Abstract

- Assessment of "excellent" (6 points) is given to the student if all the requirements for writing and defending the abstract are fulfilled. The problem is identified and its relevance is justified, a brief analysis of various points of view on the problem under consideration is made and its own position is logically stated, conclusions are drawn, the topic is fully disclosed, the volume is maintained, the requirements for external design are met, the correct answers to additional questions are given.
- Assessment of "good" (5 points) is given to the students if the basic requirements for the abstract and its defending are met, but there are flaws. In particular, there are inaccuracies in the presentation of the material; there is no logical sequence in judgments; the volume of the abstract is not sustained; there are design flaws; incomplete answers to additional questions during protection
- Evaluation of "satisfactory" (3-4 points) is given to the students if there are significant deviation from the requirements for abstract. In particular: the topic is only partially covered; actual errors were made in the content of the abstract or in answering additional questions; no output during protection.
- Evaluation of "unsatisfactory" (less than 2 points) is given to the students if his or her topic of the abstract is not disclosed, a significant misunderstanding of the problem is revealed. Student abstract is not presented.

COURSE LITERATURE (RECOMMENDED OR REQUIRED)

1. Staley, Kent W. An Introduction to the Philosophy of Science. Cambridge Introductions to Philosophy. Cambridge: Cambridge University Press, 2014.



doi:10.1017/CBO9781139047760.

2. Elman, Colin, John Gerring, and James Mahoney, eds. *The Production of Knowledge: Enhancing Progress in Social Science. Strategies for Social Inquiry*. Cambridge: Cambridge University Press, 2020. doi:10.1017/9781108762519.
3. Beins, Bernard C. *Research Methods: A Tool for Life*. 4th ed. Cambridge: Cambridge University Press, 2018. doi:10.1017/9781108557191.
4. Beins, Bernard C., and Maureen A. McCarthy. *Research Methods and Statistics*. Cambridge: Cambridge University Press, 2017. doi:10.1017/9781108550734.
5. Hagenruber, Ruth, and Uwe V. Riss, eds. *Philosophy, Computing and Information Science*. Pickering & Chatto, n.d.
6. *Writing and Publishing a Scientific Research Paper*. Ed. Subhash Chandra Parija, Vikram Kate. Springer Nature Singapore Pte Ltd. 2017. DOI <https://doi.org/10.1007/978-981-10-4720-6>