

Ukrainian State University of Railway Transport

Approved  
decision of the scientific council  
Faculty of Economics  
Prot. No. \_\_\_ from \_\_\_\_ 20\_\_ year

Recommended  
at the meeting of the department  
«Economics and Management of Production  
and Commercial Business»  
protocol No. \_\_\_\_ from " \_\_ " \_\_\_\_\_ year.

**SYLLABUS OF THE DISCIPLINE**  
**METHODOLOGY AND ORGANIZATION OF**  
**SCIENTIFIC RESEARCH**

**First semester of the 2024-2025 academic year**

second educational level (master's degree)  
branch of knowledge 07 Management and administration  
specialty 073 "Management"  
educational program: "Sustainable logistics and supply chain management"

Time and audience of classes: According to the schedule - <http://rasp.kart.edu.ua/>

1. Team of teachers:

Lecturer: Nazarenko Iryna Leonidivna (PhD econ, Associate Professor), Contacts: +38 (057) 730-10-96, e-mail: nazarenko_il@kart.edu.ua
Head of practical classes: Nazarenko Iryna Leonidivna (PhD econ, Associate Professor), Contacts: +38 (057) 730-10-96, e-mail: nazarenko_il@kart.edu.ua
Location of the department: Kharkiv city , Maidan Feuerbach, 7, Building 3, Floor 4, Auditorium 503.
Web page of the course: <a href="http://do.kart.edu.ua/">http://do.kart.edu.ua/</a> Additional information materials: <a href="http://metod.kart.edu.ua">http://metod.kart.edu.ua</a>

# Methodology and organization of scientific research



**I semester 2024-2025 academic year**

**Lectures:** as scheduled (ZOOM conferences)

**Audience:** according to the schedule

**Practices:**

according to the schedule (ZOOM conferences)

## 1. Team of teachers:

Lecturer:

Nazarenko Iryna Leonidivna (PhD econ, Associate Professor),

Contacts: +38 (057) 730-10-96, e-mail: [nazarenko\\_il@kart.edu.ua](mailto:nazarenko_il@kart.edu.ua)

Reception and consultation hours: keep an eye on the consultation schedule in Semester 1.

Location of the department: Kharkiv city , Maidan Feuerbach, 7, Building 3, Floor 4, Auditorium 503.

**The subject of study:** the methodology of scientific research and the method of conducting research on specific problems of the economy on the basis of general scientific and empirical scientific methods, which makes it possible to study economic and social processes in their kinship, differences and historical aspects. These techniques are especially effective when applying the methods of systematic research of socio-economic processes, taking into account the fact that they must constantly be improved along with the scientific-technical and socio-economic progress of society.

#### Summary of Module (Discipline)

This module aims to provide students with the knowledge and skills necessary for independently setting and solving new scientific and practical tasks and creatively using the achievements of science and technology in practical activities.

The main tasks of the module:

1. Understanding of the basic theories and concepts of scientific research: Students are given knowledge in the field of science essence, origin and development, classification of science branches, the essence of scientific cognition, knowledge and scientific research, goals and functions of science.

2. Understanding of the methodology of conducting scientific research (including empirical and theoretical methods, general for all sciences and specific methods), methods of collecting and analyzing scientific information;

3. Understanding of the basics of organizing and conducting scientific research, master's thesis as a qualification study, general requirements for the design of scientific work, language and style of scientific work, registration of results, essence, methods of writing and design of a scientific publication.

4. Understanding of the peculiarities of mental work and qualities of a scientist, which must be developed in themselves and the principles of academic integrity and ethics in science.

5. Practical exercises and cases: Students get the opportunity to choose a topic for scientific research, formulate its goal and tasks, the object and subject, to search for information sources and to choose acceptable methods for conducting research. Also they will make the list of literature for their research topic and format it in accordance with the requirements of regulatory control.

In general, the discipline "Methodology and organization of scientific research" is aimed at preparing students for successful work both in practical activities and in a possible future scientific career.

#### **Indicative Contents: The content of the module will include the following:**

Topic 1. Concept of science and its evolution

Topic 2. The formation of a scientist as a personality and the regime of their work

Topic 3. Methodology of scientific research

Topic 4. Information provision of scientific research

Topic 5. Organization of scientific research

Topic 6. Results of scientific research and their effectiveness. Principles of academic integrity.

Topic 7. General requirements and rules for the registration of the results of scientific research (in particular, master's theses)

The main tasks of the discipline are to provide students with the basics of scientific research knowledge, which they could apply both in practical activities and in a possible future scientific career.

**The purpose of the discipline** is to teach students - future masters in management - to independently set and solve new scientific and practical tasks and creatively use the achievements of science and technology in practical activities.

At the end of this module students will be able to:

LO1. (RN3) Communicate freely on professional and scientific issues in national and foreign languages orally and in writing.

LO2. (PH9). Be able to communicate in professional and scientific circles in the state and foreign languages;

LO3 (RN9) Make effective decisions under uncertain conditions and requirements that require the use of new approaches, methods and tools of socio-economic research.

LO4. (RN 11). Provide personal professional development and time management.

LO5 (RN12) Justify management decisions regarding the effective development of economic entities, taking into account goals, resources, limitations and risks

### **Employability Skills and Personal Development Planning (PDP) Skills**

During completion of this module, there will be an opportunity to achieve core skills in:

#### 1. Knowledge and Understanding (K and U)

Upon completing this module, participants will have the opportunity to develop essential skills such as defining the purpose and tasks of scientific research. They will learn how to search for scientific information relevant to their topic, select and implement appropriate research methods, and process the results obtained. Additionally, they will compare these results with theoretical prerequisites, articulate the research findings and conclusions, and prepare a master's thesis that adheres to current standards. Finally, they will also gain experience in writing a report or an article based on their scientific research outcomes.

#### 2. Practice: Applied Knowledge and Understanding

SCQF Level 11

Students are expected to be able to demonstrate a range of cognitive and intellectual skills along with scientific methods application specific to the field of scientific research, in particular writing master's diploma thesis and a scientific article.

Students will acquire the skills of determining the actual topic of scientific research, formulating the goal and tasks of research, the object and subject of scientific research, effective search for information and working with it, choosing acceptable methods for counter research and their use, determining the results of scientific research taking into account the principles of academic integrity, formulation of scientific novelty and practical value of the obtained results, design of the master's thesis according to the requirements, as well as writing and design of a scientific article based on the results of the research.

#### 3. Generic Cognitive skills

SCQF Level 11.

Practice and methods of effective communications and personnel management, including psychological features of communication with people in wartime. Ability to apply theoretical knowledge in real situations conducting scientific research, interaction and communication in the organizational environment. Ability to create, identify, and evaluate options; ability to implement and revise decisions.

Ability to analyze and solve problems that arise in the field of economics and management.

Ethics and value management: recognizing ethical situations, applying principles of academic integrity while doing scientific research.

#### 4. Communication, ICT and Numeracy Skills

SCQF Level 11.

Personal effectiveness: self-awareness and self-management; time management; sensitivity to situations that arise when establishing communications; ability communicate effectively with

various stakeholders in the process of scientific research. Ability to think critically and analyze, allowing students to effectively assess situations and make informed decisions in the context of scientific problems. The ability to present their results, argue their thoughts and convince others of the correctness of their views.

#### 5. Autonomy, Accountability and Working with others

##### SCQF Level 11

Effective use of communication and information technologies (ICT). Ability to conduct scientific research under supervision of a tutor and work independently in process of gathering scientific information and processing it. Ability to collaborate with a tutor and other stakeholders of scientific research. Two-way communication: listening, negotiating and persuading or influencing others; oral and written communication. Learning through reflection on practice and experience.

Competencies in accordance with the standard of higher education for the second master's level of specialty 073 "Management"

<https://mon.gov.ua/storage/app/media/vishcha-osvita/zatverdzeni%20standarty/2019/07/12/073-menedzhment-magistr.pdf>

##### ***General Competencies***

- GC1. Ability to conduct research at the appropriate level;
- GC3. Skills in the use of information and communication technologies;
- GC 5. Ability to act on the basis of ethical considerations (motives);
- GC 6. Ability to generate new ideas (creativity);
- GC 7. Ability to abstract thinking, analysis and synthesis

##### ***Special (professional, subject) competencies***

- SC 1. Ability to choose and use management concepts, methods and tools, including in accordance with defined goals and international standards;
- SC 3. Ability to self-development, lifelong learning and effective self-management;
- SC 7. Ability to develop projects, manage them, show initiative and entrepreneurship;
- SC9 Ability to apply scientific approach to the formation and implementation of effective projects in the social and economic sphere.

## **Why should you choose this discipline?**

Do you want to do scientific research in the future? Do you dream of entering graduate school and becoming a scientist? Are you interested in the latest achievements of science and methods of scientific research? Then this course is just for you!

After studying the course, you will know the essence of scientific cognition, knowledge and scientific research, the stages of the formation and development of science, the essence, goals and functions of science, the formation of a scientist as a personality and the mode of his work, the organization of scientific research work, you will learn to use general scientific, specifically scientific and special methods of scientific research: abstraction and concretization, induction and deduction, analysis and synthesis, and many others, search for scientific materials, conduct a literature review, perform scientific research, evaluate their results and effectiveness, and much more.

## **Organization of training**

This course, which is studied from September to December, gives students a deep understanding of the essence of creating and running an intellectual business and practical recommendations for its organizational and methodical support.

The number of ECTS credits is 3.0.

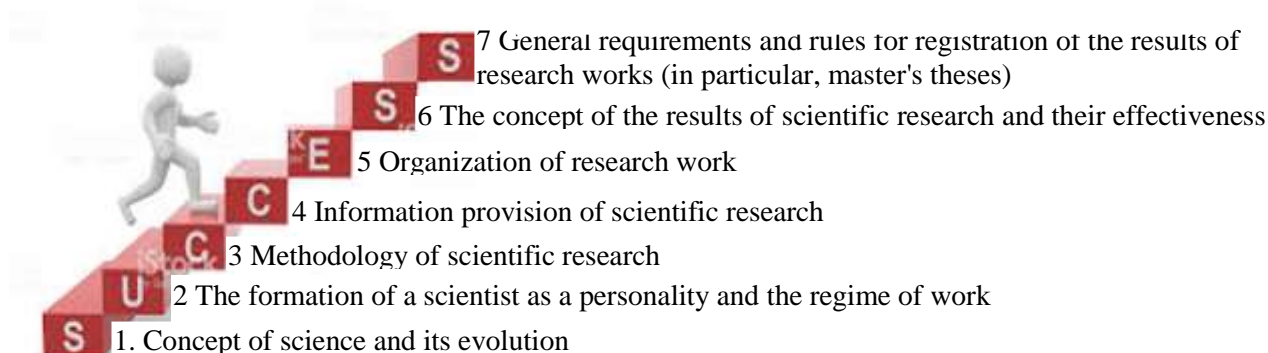
Lectures - 15 hours.

Practices - 15 hours.

Independent work - 60 hours.

The course consists of one lecture per week and one practical session once per week. It is accompanied by text material, presentations and individual tasks. Students will have the opportunity to apply the acquired knowledge and solve practical tasks in the field of scientific research. In addition, the completion and defense of an individual task on scientific research methods and writing abstracts of a scientific report for a student conference are expected.

## Topics



Practical classes of the course involve the performance of calculation and other tasks, surveys and discussions on topics, defense of essays (1 module). At the end of the course, the defense of an individual assignment is provided (module 2).

Completing the task is accompanied by immersion in related disciplines that complement the topics and forms the student's informational and communicative competence.

## Resources

Information about the course is available on the University website (<http://kart.edu.ua>), including the curriculum, lecture materials, presentations, tasks and course evaluation rules).

Additional material and links to electronic resources are available on the University's website in the "distance learning" section. The necessary preparation must be completed before the practical session begins. You should be ready for discussions and brainstorming - we want to know what you think!

### Examples of questions for discussion:

- 1 What qualities are more important for a scientist and why?
- 2 What methods of economic research do you know?
- 3 What is the essence of the modeling method and how is it used in economics?

4 How to organize work with scientific literature. Name the main tasks of literature review

5 What are the requirements for the new theory?

6 Who are the subjects of scientific activity?

7 What is the motivation of scientific work?

8 Is human cloning ethical? Using stem cells?

## Lectures and practical classes

The list of the main lectures of the course is given below.

### A. Plan of lectures, practical and laboratory classes

Week	Number of hours	Lecture topic	Number of hours	Topic of practical, seminar classes
1	2	TOPIC 1. Concept of science and its evolution		
2			2	TOPIC 1. Concept of science and its evolution
3	2	TOPIC 2. The formation of a scientist as a personality and the mode of his work		
4			2	TOPIC 2. The formation of a scientist as a personality and the mode of his work
5	2	TOPIC 3. Methodology of scientific research (part 1)		
6			2	TOPIC 3. Methodology of scientific research (part 1)
7	2	TOPIC 3. Methodology of scientific research (part 2)		
<b>Modular control of knowledge 1</b>				
8	2	TOPIC 4. Information provision of scientific research	2	
9				TOPIC 4. Methodology of scientific research (part 2). Information provision of scientific research
10	2	TOPIC 5. Organization of research work	2	
11	2			ПР-5. Організація науково-дослідної роботи
12		TOPIC 6. The concept of the results of scientific research and their effectiveness.	2	
13	2			TOPIC 6. The concept of the results of scientific research and their effectiveness.
14		TOPIC 7. General requirements and rules for registration of the results of the GDR (in	2	ПР-7. General requirements and rules for registration of the results of the

	particular, master's theses)		GDR (in particular, master's theses) Submission of individual works.
<b>Modular control of knowledge 2</b>			
<b>Exam</b>			

## Assessment rules

When filling out the credit and examination information and the credit book (individual study plan) of the student, the grade given on a 100-point scale must be transferred to the national scale (5, 4, 3,) and the ECTS scale (A, B, C, D, E)

The assessment methods used in this module will be as follows:  
written study papers with a weight of 80% 2. Group presentation weighing 20%

According to the Regulation on the implementation of the credit-module system for the organization of the educational process, a 100-point assessment scale is used in UkrSURT. The discipline during the semester is divided into 2 credit modules. Each of the credit modules is evaluated separately.

The principle of forming the grade for the credit module I and II on a 100-point scale is shown in the table, which shows the maximum number of points that a student can score for different types of academic load.

Maximum number of points for a credit module		
Ongoing control	Modular control (Testing)	Sum of points for a credit module
Up to 60	Up to 40	Up to 100

The score on a 100-point scale should be converted to the state scale (5, 4, 3,) and the ECTS scale (A, B, C, D, E)

Definition of the name on the state scale (score)	Definition of the name on the ECTS scale	On a 100-point scale	ECTS assessment	Note
"EXCELLENT" – 5 points	<b>Excellent</b> – Excellent performance with only few errors	90-100	A	
« GOOD » – 4 points	<b>Very good</b> – above average with a few bugs	82-89	B	It is possible to increase the grade to "A" during the final control
	<b>Good</b> – in general, correct work with a certain number of gross errors	75-81	C	
"SATISFACTORY" - 3 points	<b>Satisfactory</b> - not bad, but with a significant number of disadvantages	69-74	D	It is possible to increase the grade to "C" during the final control
	<b>Sufficient</b> – fulfillment satisfies the minimum criteria	60-68	E	
"UNSATISFACTORY" - 2 points	<b>Unsatisfactory</b> – you need to work before getting a test or exam (without re-studying the module)	35-59	FX	It is possible to increase the grade to "E" during the final control
	<b>Unsatisfactory</b> - serious further work is needed (re-study of the module)	<35	F	



**Control methods:** Oral questioning, current control (testing and evaluation of reports on individual tasks), modular control (tests), final testing, exam. When assessing learning outcomes, be guided by the Regulations on the control and evaluation of the quality of students' knowledge in UkrSURT (<http://kart.edu.ua/images/stories/akademiya/documentu-vnz/polojennya-12-2015.pdf>).

Practical classes:

They are evaluated by the answers and the degree of involvement in the discussion. The maximum amount is 5 points for each session, respectively up to 15 points for the 1st module and 20 points for the 2nd module.

Independent work

- Writing a high-quality essay (for the 1st module) in accordance with the principles of academic integrity and course requirements is assessed up to 30 points, essay defense with a presentation - up to 15 points;
- the performance of an individual creative task (for the 2nd module) is evaluated up to 25 points (choosing a topic, possibly the topic of a future master's thesis, formulating the object and subject of research, methods that can be used in this research, and compiling a relevant list of literature from at least 30 sources for the research of this topic), additionally writing theses of a report for a student scientific conference with design according to the requirements - up to 15 points.

Unit testing:

They are evaluated by correct answers to the test module questions (20 questions in the test, each correct answer is evaluated in 2 points). The maximum number is 40 points per module.

Exam

The student receives a final grade based on the results of the modular 1st and 2nd control by accumulating points. The maximum number of points that a student can get is 100 (up to 60 points of current control and up to 40 points of testing). The arithmetic mean of the sum of the module grades is the final score. If a student received a grade of B or D and does not agree with it, he can retake the exam and upgrade it to an A or C, respectively. The list of exam questions is given in Appendix A.

## **Topics of essays**

1. The concept of science, its role in the development of society.
2. Goals and objectives of scientific research.
3. Experimental studies.
4. Structure and classification of science.
5. Object and subject of research.
6. Expert research method.
7. Scientific research: concepts, types and forms of organization.
8. Sources of information for scientific research.
9. Plan of scientific research.
10. Training of scientific personnel.
11. Main departments of the library.
12. Prospective research plan.
13. Basic principles and methods of organizing students' scientific work. The role and tasks of NDRS.
14. Forms and methods of working with the book.

15. Research work plan.
16. Forms of involvement of students in educational and research work (NDRS), their content.
17. Drawing up a synopsis.
18. Architecture of scientific work (abstract, introduction, theoretical and practical parts, efficiency calculation, conclusions, etc.).
19. Rational organization of the researcher's mental work.
20. Generalization, selection and processing of information.
21. Methodology of writing a scientific article.
22. Scientific directions of research in economics.
23. Objects of scientific research and their classification.
24. Hypothesis and its proof.
25. Choosing the topic of scientific research: factors, techniques and means.
26. General scientific research methods.
27. Processing of scientific information.
28. Criteria for choosing and justifying the topic of scientific research.
29. Problems and methods of theoretical research.
30. Scientific experiment: goal, tasks, method of conducting.

### **Teaching team:**

Iryna Leonidivna Nazarenko ([http://kart.edu.ua/staff/nazarenko\\_il](http://kart.edu.ua/staff/nazarenko_il)) is a lecturer on innovative development, intellectual business and business trainings at UkrDUZT. She received the degree of Doctor of Economic Sciences. in the specialty 07.08.04 - "Economics of transport and communication" at UkrDUZT in 2001.

In 2004 - 2005, successfully carried out scientific research under the grant of the President of Ukraine on the topic "Complex methodology for determining the level of economic security, risk assessment and probability of bankruptcy of enterprises" under contract No. F8/302 - 2004 dated November 22, 2004, state registration number 0105U000900. Based on the results of the grant, letters were sent to the President of Ukraine and the Ministry of Economy of Ukraine.

In 2020, passed the Cambridge exam and received a certificate in Advanced English (CAE).

In 2021, at KhNU named after V.N. Karazina received a master's degree in philology with honors (specialty 035.041 Germanic languages and literatures (including translation), the first one is English), the subject of the qualification work is "Formation of foreign language competence of adult students in speaking and listening (on the topic of "Startups").

Areas of scientific activity: innovative development of the enterprise, innovative infrastructure of the region; intellectual capital of the enterprise; business planning, business modeling; economic security of the enterprise and railway transport; economic potential of the enterprise; assessment of personnel and innovation potential of the enterprise; application of the cost management concept at railway transport enterprises, etc.

### **Code of academic integrity**

Violation of the Code of Academic Integrity of the Ukrainian State University of Railway Transport is a serious violation, even if it is unintentional. The code is available at the following link: <https://kart.edu.ua/wp-content/uploads/2020/06/kodex.pdf>.

In particular, compliance with the Code of Academic Integrity of UkrDUZT means that all work on exams and tests must be done individually. During independent work, students can consult with teachers and other students, but must solve tasks independently, guided by their

own knowledge, skills and abilities. References to all resources and sources (for example, in reports, independent papers or presentations) should be clearly identified and properly formatted. In the case of joint work with other students on individual tasks, you should indicate the degree of their involvement in the work.

## **Integration of students with disabilities**

Higher education is a leading factor in raising social status, achieving spiritual and material independence and socialization of youth with limited functional capabilities and reflects the state of development of democratic processes and humanization of society.

To integrate students with disabilities into the educational process of the Ukrainian State University of Railway Transport, a distance learning system was created based on modern pedagogical, information, and telecommunication technologies.

Access to distance learning materials from this course can be found at the following link: <http://do.kart.edu.ua/>

## **Appendix A**

Questions for the exam in the discipline "Methodology and Organization of Scientific Research"

- 1 The essence of scientific cognition, knowledge and scientific research
- 2 Stages of formation and development of science
- 3 The essence, goals and functions of science
- 4 Basic concepts of science, their characteristics
- 5 Classification of sciences in Ukraine
- 6 Education of creative abilities of the future scientist
- 7 Main features of a scientist
- 8 Features of mental work
- 9 Organization of the scientist's creative activity
- 10 Working day of a scientist
- 11 The structure of management of scientific activity in Ukraine
- 12 Priority areas of science development in Ukraine
- 13 Classification and stages of GDR
- 14 Selection of the problem and requirements for the research topic
- 15 Specification of the research problem
- 16 Planning of scientific research
- 17 Concept of scientific method and its main features
- 18 System of research methods and principles
- 19 General scientific methods
- 20 Concrete scientific methods of scientific research
- 21 Methods of economic research
- 22 The essence and types of scientific and technical information
- 23 Methods of searching and collecting scientific information

- 24 Analysis and interpretation of information
- 25 Organization of work with scientific literature
- 26 Forms of exchange of scientific information
- 27 The concept of the results of scientific research
- 28 Stages of scientific research and their formalization
- 29 Requirements for the results of scientific activity
- 30 Evaluation of the results of scientific activity, their effectiveness
- 31 Language and style of scientific work
- 32 What is plagiarism? How to correctly formalize the use of the works of other researchers?
- 33 General requirements for registration of scientific work
- 34 Scientific publication: essence, method of writing and design
- 35 Scientific report: essence, method of writing and design
- 36 The system of training scientific and scientific-pedagogical personnel in Ukraine
- 37 How is the economic effect of scientific research calculated?
- 38 Academic degrees and academic titles
- 39 Ethical norms and values of science
- 40 Describe the content of internal and external evaluation of the results of scientific activity
- 41 Reveal the meaning of concepts: scientific idea, hypothesis, law, judgment, inference, theory
- 42 Name the difference between intermediate, side, "raw" and questionable results
- 43 What are the requirements for the new theory?
- 44 Who are the subjects of scientific activity?
- 45 What is the motivation of scientific work?
- 46 Name the features of scientific work
47. Name the most characteristic psychological personality traits of scientists.
48. What are the requirements for organizing the mental work of a scientist?
49. What is related to scientific research work of students? Name the purpose and tasks of students' research work
- 50 Reveal the sequence of works on choosing a research topic
- 51 Name and describe the methods used both at the empirical and theoretical levels of research
- 52 Name and describe the methods of theoretical research
- 53 What methods of economic research do you know?
- 54 What is the essence of the modeling method and how is it applied in economics?
- 55 How does the method of going from the abstract to the concrete differ from the method of abstraction?
- 56 What is the difference between reporting, literary and normative materials?
- 57 How to organize work with scientific literature. Name the main tasks of literature review
- 58 Name the general values of academic integrity
- 59 Name the violation of academic integrity, according to the Code of Academic Integrity of UkrDUZT.
60. Reveal the essence of the value of academic integrity "responsibility".