

**Ministry of Education and Science of Ukraine
Lutsk National Technical University**



METHODOLOGY OF SCIENTIFIC RESEARCH

Guidelines for practical sessions and independent study
for students pursuing a second (Master's) level of higher education
within the educational and professional programme 'Educational and Pedagogical
Sciences (Inclusive Education)'
field of study A: Education
specialisation A1: Education
full-time and part-time modes of study

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M-24 Methodology of Scientific Research : Guidelines for practical sessions and independent study for students pursuing a second (Master's) level of higher education within the educational and professional programme 'Educational and Pedagogical Sciences (Inclusive Education)', field of study A: Education specialisation A1: Education full-time and part-time modes of study /
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These teaching guidelines have been drawn up in accordance with the course syllabus. They set out the content of the practical sessions, a list of recommended reading, and the criteria for assessing students' work.

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INTRODUCTION

The course 'Research Methodology' provides the theoretical foundation for preparing students for their future scientific and teaching careers. The course is designed to equip students with practical knowledge to effectively meet the requirements for the planning, organisation and implementation of research activities within the higher technical education system.

The aim of the course is to provide students with knowledge of the fundamentals of conducting scientific research, to develop their practical skills and abilities in solving real-world problems relating to the formulation, organisation, planning and execution of scientific research, as well as the management of scientific and technical work and collective scientific creativity.

Tasks of studying the discipline:

- familiarization of students with modern methodological concepts, the basics of the methodology of scientific knowledge and the methodology of scientific research;
- formation of a holistic view of the research process;
- mastering the skills of forming and using a conscious methodological position of scientific research;
- improvement of skills in searching, selecting and processing scientific information, in accurately formulating the purpose, objectives and conclusions of the research.

The following assessment tools and methods for demonstrating learning outcomes are used in the course of studying this subject:

Teaching methods

TM₁- Verbal: conversation, story, explanation, annotated reading of the text.

TM₂- Practical: classes/contact hours, performing exercises according to the provided sample.

TM₃- Visual: illustration, demonstration.

TM₄- Work with educational and methodical literature (thesis, annotation, essay writing).

TM₅- Video method in combination with the latest information technologies and computer learning tools (distance, multimedia).

TM₆- Self-study (writing an essay, preparing a presentation, working on a team project).

TM₇- Individual research work of students.

Assessment methods

AM₂- Oral or written questioning.

AM₄- Testing.

AM₅- Team projects.

AM₆- Essay.

AM₇- Presentation of the results of completed tasks and researches.

AM₈- Presentations and speeches at scientific events.

AM₉- Evaluation of the results of individual tasks.

AM₁₀- Credit.

ASSESSMENT OF FORMS AND CRITERIA

Summative credit score (on a 100-point scale) in Professional English is determined as a weighted average value, depending on the specific weight of each credit component:

	Formative assessment	Module control test	Summative control Complex practical individual task		Summative credit score
<i>Credit module</i>	Credit module 1	Credit module 2	Credit module 3		
<i>Assessment methods</i>	AM ₂ , or AM ₄ , or AM ₅ , or AM ₇ , or AM ₉	module control test (AM ₄ , AM ₆)	individual task (AM ₅ , or AM ₇ , or AM ₈)	credit AM ₁₀	Weighting
<i>Weighting</i>	100	100	100	-	100
<i>Maximum score (on a 100-point scale)</i>	40	40	20	-	100%

The final grade in the discipline (educational component) is calculated as a weighted average of the grades obtained for the credit modules.

The assessment of students' knowledge is carried out in accordance with the general criteria in parallel with the

- 4-point national scale (positive grades - "excellent", "good", "satisfactory" or "passed", negative grades - "unsatisfactory" or "failed");
- 100-point cumulative ECTS scale.

Scale of Assessment

University grade scale	National scale	ECTS scale
90-100	Excellent	A (Excellent)
85-89	Very good	B (Very good)
75-84	Good	C (Good)
65-74	Satisfactory	D (Satisfactory)
60-64	Sufficient	E (Sufficient)
35-59	Fail	FX (Fail, some more work required before the credit can be awarded)
1-34	Fail	F (Fail, mandatory repeated course is required)

Assessment criteria:

90–100 points are awarded to a student who is fluent in the program material, reveals and demonstrates personal creative abilities, knows how to acquire new knowledge independently, demonstrates thorough knowledge, skills and practical skills. A student finds and processes the necessary information without the help of a teacher, knows how to use acquired knowledge and skills to make decisions in non-standard situations, knows how to use methods of scientific substantiation of own decisions.

75–84 points are awarded to a student who is able to compare, generalize, systematize information under the guidance of a teacher, independently apply it in practice; to correct mistakes, including significant ones, to select individual arguments to support opinions.

65–74 points are awarded to a student, who reproduces a significant part of the theoretical material, demonstrates knowledge and understanding of the main points with the help of the teacher, can superficially reproduce and analyze the educational material, correct mistakes, among which there is a significant number of essential ones.

60–64 points are awarded to a student who knows the educational material at a level higher than the initial one, reproduces a significant part of it at the reproductive level, or knows the material at the level of separate fragments that represent an insignificant part of the educational material.

35–59 points are awarded to a student of higher education who has mastered the material at the level of separate fragments that represent a small part of the educational material.

0–34 points are awarded to a student who has knowledge at the level of basic recognition and reproduction of some facts, elements, objects.

Formative assessment

The formative assessment takes into account the performance of one assignment of your choice for each topic as agreed by the teacher and the student. The total number of points of the current control for the semester is assessed on a 100-point scale.

Criteria for formative assessment

Criteria for assessing students' knowledge	The maximum number of points
Points of current academic performance for participation in practical classes (AM ₂ , or AM ₄ , or AM ₅ , or AM ₇)	Up to 10 points per lesson
- a detailed, exhaustive statement of the content of the question; - a complete list of categories and concepts necessary for disclosing the content of the issue; - correct disclosure of the content of categories and concepts, the mechanism of their relationship and interaction; - ability to carry out a comparative analysis of different theories, concepts, approaches and independently draw logical conclusions and generalisations; - ability to apply didactic principles; - demonstration of the ability to express and argue one's own attitude to alternative views on a given issue; - giving examples of application in the educational process;	10
- compared to the answer with the highest score, at least one of the points mentioned above (if it is necessary for an exhaustive disclosure of the question) is not disclosed;	8

- when disclosing the content of the question in general correctly according to the specified requirements, the student still made inaccuracies in the wording of terms and categories, but with the help of the teacher he/she quickly navigates and finds the correct answers	
- Compared to the answer with the highest score, two of the items listed above (if they are required for a comprehensive disclosure of the issue) are not disclosed; - both types of deficiencies, which separately characterise the criteria for the highest score, are present at the same time; - the answer is not well-grounded, incomplete; - the student does not give examples of application in the educational process; - the student can only understand and correct their mistakes with the help of the teacher	6
- Compared to the highest score, three or more of the items listed above (if they are required for a comprehensive disclosure of the issue) are not disclosed; - two or more types of deficiencies occur simultaneously; - the answer lacks adequate evidence and arguments, the conclusions drawn do not correspond to the generally accepted ones, and are incorrect; - the nature of the answer gives reason to believe that the student has misunderstood the essence of the question or does not know the correct answer; - Gross mistakes are made and the student cannot correct them	2-4
- the student is not ready for class	0
Presentations and speeches at scientific events (AM ₈)	10
Zagalom for the semester	up to 100 points

The final grade for the current control is defined as the sum of points from all classes and is calculated during the assessment after the last class of the semester.

Elimination of debts on current control measures can be carried out throughout the period of study of the discipline (educational component) in the semester. A student who has unsatisfactory grades or missed classes without valid reasons is assigned a semester grade based on the results of the current control after working on them (eliminating debts on the topic of the class).

Modular control

Module control is assessed on a 100-point scale and provides an intermediate assessment of the quality of theoretical and practical material mastered by the student. There are 2 module tests according to the schedule of the educational process.

Assessment criteria for module control

On the electronic educational portal of LNTU	Maximum
Testing (MO ₄ , MO ₆)	up to 50 points
Multiple choice question (1 point for the correct answer, 20	20

questions);	
matching (4 points for the correct answer, 5 questions)	20
open-ended question (essay) (assessment criteria are similar to the current one).	10
Semester total	up to 100 points

Retakes of modules with a positive grade (more than 60% of points) are not allowed. Retakes of negative module results or due to failure to attend the module without valid reasons are allowed before the date of the next module control.

Final control

The individual task is defended by the applicant in the last week of the semester according to the schedule of the educational process. Completion of the individual assignment is one of the mandatory components of the credit modules.

Assessment criteria for individual task

Criteria for assessing students' knowledge	The maximum number of points
Individual task	Up to 100 points
- a detailed, exhaustive presentation of the content of the issues in print; - study of the necessary periodical scientific sources with proper references in the text; - a complete list of categories necessary for disclosing the content of the questions; - analyses the advantages and disadvantages of the problem under study; - the prospects of application in the educational process are given; - demonstrated scientific development with all the required elements; - prepare and present a presentation of the topic;	90-100
- in comparison with the work with the highest score, one of the points listed above (if they are required for an exhaustive disclosure of the issue) is not disclosed; - demonstrated scientific development with the main elements required; - a presentation of the topic was prepared and presented;	75-89
- compared to the work with the highest score, two or more of the points listed above (if they are required for an exhaustive disclosure of the issue) are not disclosed; - demonstrated a scientific development with one or two required elements; - the student did not study the materials of the scientific periodicals; - the student has not prepared a presentation;	60-74

- the student's work is not well-grounded, incomplete; - no list of references is given;студент не підготував презентацію	35
- individual work is not performed or borrowed from others	0

The final control is carried out in the form of a test. This is a form of final control of theoretical and practical material mastered by the student in a particular discipline (educational component), which is given based on the results of current and module control and does not require the mandatory presence of students.

The student is considered admitted to the semester control (test) in the discipline "Methodology of scientific research" if he/she has completed all types of work provided for by the work programme of the discipline.

TOPICS AND CONTENT OF PRACTICAL SESSIONS

Practical session No. 1 (4 hour)

Topic: The concept of science.

Aims: to consolidate and deepen knowledge of the theoretical foundations of scientific research.

Questions for discussion

1. The system of scientific knowledge. Functions of science. Scientific and non-scientific knowledge of the world.
2. The concept of theory, methodology and methods of science.
3. The effectiveness of science. Quantitative indicators and rates of development.
4. The main issues of scientific activity regulated by the laws of Ukraine "On Scientific and Scientific-Technical Activity", "On Higher Education".
5. Principles and practices of Open Science (UNESCO).
6. Science and sustainable development of society.

References: main [1-2; 4-8; 10], additional [4; 9; 14; 17; 18].

Practical tasks

Task 1. Science and scientific knowledge. Complete the following scheme by identifying the main characteristics of scientific knowledge and distinguishing it from everyday knowledge:

Scientific knowledge → objectivity → _____ → _____ → _____ → _____

Answer the questions:

1. What makes knowledge scientific?
2. How does scientific knowledge differ from common-sense knowledge?
3. Why are evidence and systematic methods important in educational research?

Task 2. The functions of science in educational research. Match the functions of science with their descriptions and provide one example from Educational Sciences for each function.

Function	Description	Example in Educational Sciences
Descriptive		
Explanatory		
Predictive		
Practical/transformational		

Discussion: Which function is the most important for a master's research project? Justify your answer.

Discussion task 3.

Indicate the field of science, type of research, and methods used. New theories do not replace previous ones, but only indicate the limits of their application. No matter how brilliant a scientist may be, he or she relies on the experience of their predecessors. Isaac Newton emphasised this figuratively when he said that he stood on the shoulders of giants. Give an example that illustrates this thesis.

Practical session No. 2 (4 hours)

Topic: The main categories of science.

Aims: to deepen knowledge of science and its categories.

Questions for discussion

1. The main structural elements of science: principles, postulates, concepts, definitions, categories, axioms, regularities, laws.
2. The concept of a scientific hypothesis.
3. The process of cognition: observation - accumulation of facts - abstract thinking - practice.
4. Methodology - method - technique.
5. Scientific paradigm.
6. Principles of scientific knowledge: the principle of objectivity; the principle of explaining a set of phenomena under study with the help of a few general ideas; the principle of sufficient completeness of justification; the principle of systematicity; the principle of unity of analysis and synthesis; the principle of unity of historical and logical; the principle of ascent from the abstract to the concrete.

References: main [2; 4-8; 10], additional [3; 15-16].

Для цієї теми варто зосередити завдання на розумінні **основних категорій науки** та їх застосуванні до освітньо-педагогічних досліджень.

Practical tasks

Task 1. Key categories of science. Match the scientific categories with their definitions. Then give one example of each category from Educational Sciences.

Category	Definition	Example in Educational Sciences
Scientific fact		
Scientific concept		
Scientific hypothesis		
Scientific theory		
Scientific law/principle		
Scientific method		

Task 2. From a research problem to a scientific theory. Arrange the following categories in a logical sequence of scientific inquiry:

scientific theory – research problem – hypothesis – scientific facts – research methods – conclusions

Then explain in 3–5 sentences how these categories are interconnected in the process of educational research.

Task 3. Applying scientific categories to an educational study. Consider the research topic:

“The use of Artificial Intelligence tools to improve students’ learning outcomes in higher education.”

Identify: the research problem; a possible scientific concept; a hypothesis; possible scientific facts/evidence; appropriate research methods; a possible theoretical conclusion.

Briefly explain how each category contributes to the development of the research.

Practical session No. 3 (4 hours)

Topic: The essence and features of the process of scientific cognition

Aims: to deepen knowledge of science, its categories and methods of scientific research.

Questions for discussion:

1. The concept of research methods; general (general) and special (specific), new and traditional methods.
2. Features of the scientific method: objectivity, reliability, validity, determinism, efficiency, adequacy.
3. General methods of knowledge: empirical and theoretical. Qualitative and quantitative methods.
4. Mathematisation and computerisation of science. The role of modelling.
5. Heuristic methods of cognition.

Literature: basic [3; 4; 10], additional [2; 15-16].

Practical tasks

Task 1. Features of scientific cognition. Identify whether each statement describes scientific cognition or everyday cognition. Explain your choice.

1. Knowledge is based on systematic observation and evidence.
2. A conclusion is based mainly on personal experience.
3. Research results can be verified by other researchers.
4. Knowledge is obtained through the use of scientific methods.
5. Conclusions may depend on personal beliefs or intuition.
6. Research follows a clearly defined procedure.

Then identify three main features of scientific cognition that are especially important in educational research.

Task 2. Stages of scientific cognition. Put the stages of the scientific cognition process in the correct order:

formulation of a hypothesis – observation of a phenomenon – analysis of data – formulation of a research problem – collection of empirical data – drawing conclusions – testing the hypothesis

Then answer:

- What is the role of a hypothesis in scientific cognition?
- Why is empirical evidence important?
- At which stage can the researcher revise the original hypothesis?

Task 3. Methods of scientific cognition. Match each research situation with the most appropriate scientific method and explain your choice.

Research situation	Method
Studying students' attitudes toward online learning	
Comparing the learning outcomes of two groups	
Examining the relationship between motivation and academic achievement	
Studying how a new teaching method works in practice	
Analyzing previous research on inclusive education	

Methods: *observation, experiment, comparison, survey, analysis and synthesis, statistical analysis.*

Practical session No. 4 (4 hours)

Topic: General scientific aspects of research methodology.

Aims: to consider the main aspects of research methodology and their implementation.

Questions for discussion:

1. The general structure of research work.
2. Choosing a research topic. Relevance, novelty, effectiveness of the topic.
3. Formation of research objectives.
4. Information base of research. Methods of primary information processing, its sources and media.
5. Choice of research methodology - scheme and methods of solving problems.
6. Evaluation of the effectiveness of scientific research.
7. Implementation and testing of scientific research.

References: main [3-8], additional [1-2; 6; 9; 20; 21].

Practical tasks

Task 1. Methodology, methods and methodology of research. Complete the table by explaining the difference between methodology, research methodology, research method and research technique. Give an example related to Educational Sciences.

Concept	Definition	Example in Educational Sciences
Methodology		
Research methodology		
Research method		
Research technique		

Task 2. Methodological foundations of a research study. Analyse the following research topic: **“The use of digital learning technologies to develop students’ critical thinking in higher education.”**

Identify: the research problem; the object and subject of research; the research purpose; a possible research hypothesis; appropriate theoretical and empirical methods; the expected research outcome.

Explain how these methodological components are interconnected.

Task 3. Choosing an appropriate research methodology. Read the following research questions and determine which methodological approach would be most appropriate: **quantitative, qualitative, or mixed methods.**

1. What is the relationship between students’ digital competence and their academic achievement?
2. How do students with disabilities perceive the accessibility of digital learning resources?
3. Does the use of an interactive learning platform improve students’ learning outcomes?
4. What factors influence teachers’ attitudes toward the use of artificial intelligence in education?

For each question, justify your choice in 2–3 sentences and suggest one appropriate research method.

Practical session No. 5 (4 hours)

Topic: Development of conceptual provisions and research apparatus.

Aims: to study and consolidate the basic rules of preparation for writing a research paper and the methodology of the initial stage of research.

Questions for discussion:

1. The concept of research relevance and determining the degree of its scientific development.

2. Definition of the object, subject, topic of research.

3. Collection and selection of information for the study.

4. Formulation of the general and intermediate goals of the study.

5. Choosing a methodology, basic theoretical provisions of the study.

6. Determining the course and expected results of the study.

7. Building a research hypothesis, choosing research methods.

References: main [1-10], additional [9-12; 15; 16; 22].

Practical tasks

Task 1. Developing the research apparatus. Consider one of the research topics:

“Inclusive practices as a means of improving the accessibility and quality of higher education.”

“Digital Accessibility as a Condition for Inclusive Higher Education”

“Inclusive Teaching Practices for Supporting Students with Diverse Educational Needs”

Develop the basic research apparatus by defining:

1. The relevance of the research – explain why the problem is important today.

2. The research problem – formulate the key contradiction or unresolved issue.

3. The object of research – identify the broader process or phenomenon being studied.

4. The subject of research – specify the particular aspect of the object to be investigated.

5. The aim of the research – formulate the expected overall result.

6. Research objectives – formulate 4–5 specific objectives needed to achieve the aim.

7. Research hypothesis – suggest a possible assumption about how inclusive practices can improve accessibility and quality of higher education.

Discussion: Explain how the elements of the research apparatus are logically interconnected.

Task 2. Developing conceptual provisions. Choose a topic related to your master's research and formulate 3–5 conceptual provisions that could form the theoretical basis of the study.

For each provision:

- formulate the main idea in **1–2 sentences**;
- identify the key concepts it contains;
- explain how it is related to the research problem;
- indicate what evidence or methods could be used to substantiate it.

Discussion: What makes a conceptual provision scientifically justified rather than simply an author's opinion?

Practical session No. 6 (4 hours)

Topic: Features of conducting pedagogical research.

Aims: to consolidate and deepen knowledge of the theoretical foundations of information support for research and experimentation.

Questions for discussion:

1. General scientific and empirical methods of pedagogical research.
2. Reliability of research results. Methods of mathematical processing in pedagogy.
3. Measuring scales.
4. Grouping of research data.
5. Statistical processing of pedagogical research data.
6. Practical significance of the research results and their implementation.

References: main [1; 3; 9; 10], additional [1; 6; 12; 13].

Practical tasks

Task 1. Information support of pedagogical research. Analyse the research topic: "The effectiveness of inclusive teaching practices in higher education."

Identify what types of information would be needed at different stages of the research:

Stage of research	Information needed	Possible sources
Formulating the research problem		
Theoretical analysis		
Designing the research		
Conducting the experiment		
Analysing the results		
Formulating conclusions		

Explain why reliable and up-to-date information is essential for the validity of pedagogical research.

Task 2. Information support of a pedagogical experiment. Imagine that you are conducting an experiment to evaluate the effectiveness of a digital tool for supporting students with special educational needs.

Develop a brief information-support plan that specifies:

1. what data should be collected;
2. what sources and research instruments should be used;
3. how the data should be documented and stored;
4. what methods could be used to analyse the results;
5. how the reliability and validity of the obtained data could be ensured.

Можна додати практичне завдання, у якому магістри не лише обчислюють показники, а й інтерпретують результати педагогічного експерименту.

Task 3. Mathematical processing and interpretation of research results.

A pedagogical experiment was conducted to evaluate the effectiveness of an inclusive digital learning tool. Students completed a knowledge test before and after the intervention. The maximum score was 20 points.

Group	Before the intervention	After the intervention
Experimental group (n = 20)	11.2	15.8
Control group (n = 20)	11.4	12.9

Tasks:

1. Calculate the **mean score increase** in each group.
2. Calculate the **percentage increase** in the experimental and control groups.
3. Determine the difference between the groups in their final mean scores.
4. Present the results in a suitable diagram or graph.
5. Interpret the results: **Does the data provide evidence that the digital learning tool was effective?**
6. Identify what additional statistical test could be used to determine whether the difference between the groups is **statistically significant**.

Discussion: Why is it important to distinguish between a numerical difference in research results and a statistically significant difference?

Practical session No. 7 (4 hours)

Topic: Research data processing and presentation of results.

Aims: to consolidate and deepen knowledge of the presentation of research results.

Questions for discussion:

1. Basic requirements for writing a research paper.
2. Standards of formatting (articles, references, illustrations, abbreviations, formulas, etc.).
3. Rules of formatting and requirements for articles, work reports, abstracts, monographs, student papers, dissertations, reports, etc.
4. Preparation of the research presentation.
5. Public defence of research results.

References: main [3; 4; 8-10], additional [6; 7; 16-18].

Practical tasks

Task 1. Processing and presenting quantitative data. The results of a survey on students' satisfaction with inclusive learning practices were measured on a 5-point scale.

Response	Number of students
1 – Very dissatisfied	3
2 – Dissatisfied	5
3 – Neutral	8
4 – Satisfied	14
5 – Very satisfied	10

Tasks:

1. Calculate the percentage of students for each response.
2. Calculate the mean satisfaction score.
3. Identify the most frequent response (mode).
4. Present the results as a table and a suitable chart.
5. Write a brief 2–3 sentence interpretation of the results.

Task 2. Comparing research results. A pedagogical experiment investigated the effectiveness of an inclusive teaching approach.

Group	Pre-test mean	Post-test mean
Experimental group (n = 25)	12.4	16.8
Control group (n = 25)	12.6	14.1

Tasks:

1. Calculate the change in mean scores for each group.
2. Calculate the percentage improvement.
3. Present the results in a comparative chart.
4. Write a short conclusion about the effectiveness of the teaching approach.
5. Suggest which statistical test could be used to determine whether the differences are statistically significant.

Task 3. Presenting research results in an academic text. Rewrite the following raw research information as a paragraph suitable for a master's thesis or research article.

40 students participated in the survey. 28 students said that digital learning materials were easy to use. 8 students were uncertain. 4 students found them difficult to use.

Include:

- the total number and percentage of respondents;
- the main finding;
- an objective academic interpretation;
- a reference to the corresponding table or figure.

Discussion: What principles should be followed when presenting quantitative research results to ensure that they are clear, accurate and objective?

Practical session No. 8 (2 hours)

Topic: Academic integrity in research.

Aims: to understand the need to comply with and the mechanism for verifying academic integrity in the performance of master's work.

Questions for discussion:

1. Academic integrity according to the Law of Ukraine "On Education".
2. Services of instrumental plagiarism checking.
3. Recommendations for the prevention of academic plagiarism.
4. Moral principles of academic integrity.
5. Artificial intelligence tools in scientific research.

References: main [1-5; 9], additional [1; 5; 12; 13; 17].

Practical tasks

Task 1. Identifying violations of academic integrity. Read the following research situations and determine whether they constitute a violation of academic integrity. If so, identify the type of violation and suggest how it could be avoided.

1. A student copies a paragraph from an article without citing the source.
2. A researcher paraphrases an author's idea and provides a reference to the original source.
3. A student uses research data collected by another researcher but presents them as their own.

4. A researcher changes several numerical results to support the research hypothesis.
5. A student uses a generative AI tool to help formulate a text but does not check the accuracy of the information.
6. A student submits a paper previously prepared for another course without appropriate disclosure.

Task 2. Citation and paraphrasing practice. Take a short paragraph from a scholarly source related to inclusive education or educational technologies.

1. Paraphrase the information in your own words.
2. Provide an appropriate **in-text citation**.
3. Prepare the corresponding **reference list entry** in APA 7th edition.
4. Explain why your version does not constitute plagiarism.

Task 3. Checking academic integrity in a master's thesis. Imagine that you are preparing your master's thesis for submission.

Develop a 5-step academic integrity verification procedure, including:

- checking quotations and references;
- checking paraphrased material;
- verifying the accuracy and originality of research data;
- using plagiarism/similarity detection software;
- reviewing the final reference list and citations.

Then analyse a hypothetical similarity-check report and explain which findings require further examination and which do not necessarily indicate plagiarism.

Discussion: Why should academic integrity be considered throughout the entire research process rather than only immediately before submitting the master's thesis?

INDIVIDUAL TASK

A Complex practical individual task (IT) in the discipline "Methodology of scientific research" is completed during the semester. Completion of the assignment is a prerequisite for successful completion of the course and obtaining a positive grade.

The purpose of the individual assignment is to apply theoretical knowledge of the discipline to solve problems and exercises, develop independent work skills, systematise knowledge, and study individual issues in depth. The individual assignment is defended during the semester during the hours allocated for individual work. When completing and submitting an individual assignment, a student may use the recommended literature, guidelines, and Internet resources. The IT is assessed on a 100-point scale. Completion of the ICP is one of the mandatory components of the credit modules.

Tasks of the discipline "Methodology of Scientific Research":

1. Determine the field of science, purpose, objectives, object, subject of the future thesis.
2. Development of questionnaires, questionnaires, methods for obtaining empirical data on the topic of the thesis.
3. Make an abstract (up to 200 words) of the thesis.
4. Write and format the an article or conference proceedings on the topic of the thesis.

SELF-ASSESSMENT TESTS

1. Science as a form of human consciousness:
 - a) provides an objective reflection of the world;
 - b) reveals the laws governing the development of nature, society and thought;
 - c) brings together the intellectual potential of society;
 - d) shapes the values of society.
2. The conceptual framework of science is formed by:
 - a) concepts.
 - b) facts;
 - c) categories;
 - d) ideas.
3. Science as a system of knowledge:
 - a) reveals the laws governing the development of nature, society and thought;
 - b) provides an objective reflection of the world;
 - c) constitutes a creative activity that unites the intellectual potential of society;
 - d) is a form of social practice linked to the accumulation and application of new knowledge.
4. Fundamental research is:
 - a) scientific theoretical or experimental activity aimed at acquiring new knowledge about the patterns of development and the interrelationships between nature, society and thought;
 - b) the study of structural links and patterns of development in economic and social processes and phenomena;
 - c) the synthesis of disparate ideas about the laws governing nature, society and thought, whilst retaining within these generalised concepts everything that can be applied in practice;
 - d) scientific and scientific-technical activities aimed at acquiring and utilising knowledge for practical purposes.
5. A system of reliable knowledge about reality, which describes, explains and predicts phenomena within a specific field of study, is:
 - a) a theory;
 - b) a category;
 - c) a concept;
 - d) a principle.
6. Induction is:
 - a) a method of scientific research in which conclusions about the general are drawn on the basis of conclusions about the particular;
 - b) a method of scientific research based on moving from the general to the particular;
 - c) a method of scientific research that allows characteristics to be transferred from a known phenomenon to an unknown one;
 - d) a method of scientific research in which the internal aspects and relationships between the objects under study are revealed.

7. The concept of 'deduction' refers to:

- a) a method of scientific research based on reasoning from the general to the particular;
- b) a method of scientific research in which the internal aspects and relationships between the objects under study are revealed;
- c) a method of scientific research that allows characteristics to be transferred from a known phenomenon to an unknown one;
- d) a method of scientific research whereby conclusions about the general are drawn on the basis of conclusions about the particular.

8. The objective of scientific research is:

- a) the expected final outcome, i.e. what is to be achieved as a result of the research;
- b) a body of evidence concerning a particular phenomenon under study;
- c) a set of specific objectives aimed at analysing and solving a problem;
- d) any level or aspect of reality, a phenomenon or a process that gives rise to a problematic situation.

9. The process or phenomenon that gives rise to a problem situation and has been selected for study constitutes:

- a) the research topic;
- b) the subject of the research;
- c) the object of the research;
- d) the aim of the research.

10. A bibliographic description is:

- a) a concise summary of the content of a particular document, including key facts and conclusions;
- b) the result of compiling, in accordance with established rules, a list of details about a document that enables it to be fully identified and locate it amongst others;
- c) the process of compiling a concise description of the content and purpose of a document, its main theme and the aim of the work carried out;
- d) there is no correct answer.

11. A qualified academic work in a specific field of knowledge, characterised by internal coherence and the relevance of the research findings and scientific propositions put forward by the author for public defence, is:

- a) an abstract;
- b) a thesis;
- c) an article;
- d) a research paper.

12. A course paper is:

- a) an independent academic research project undertaken by a student as part of a specific course;
- b) a qualification project on the basis of which the State Examination Board assesses a

- graduate's level of theoretical knowledge;
- c) a review of academic literature presented in the form of a report;
- d) there is no correct answer.

13. An abstract is...

- a) a brief overview of the content of a book or article, often accompanied by a critical assessment;
- b) the public delivery of a speech, statement or information;
- c) a type of publication in which interim or final results are presented, specific individual issues relating to the research topic are highlighted, the author's scientific priority is established, and the material is made available to specialists;
- d) a publicly delivered statement or a detailed exposition of a particular scientific problem.

14. The forms of students' research work within the educational process are:

- a) work on research-based topics;
- b) holding specialised research seminars under the supervision of the department;
- c) writing articles, abstracts of papers and other publications;
- d) students' participation in the implementation of state-funded research projects.

15. Forms of students' research work outside teaching hours include:

- a) participation in academic competitions, contests, exhibitions and the preparation of student research collections;
- b) carrying out individual research-based tasks during work placements, and writing course papers and dissertations;
- c) students giving lectures to disseminate knowledge in the field of their professional training;
- d) organising specialised academic seminars under the supervision of the department.

16. Academic degrees are:

- a) Candidate of Sciences;
- b) Doctor of Sciences;
- c) Associate Professor;
- d) Professor.

17. Academic titles include:

- a) senior research fellow;
- b) associate professor;
- c) professor;
- d) Doctor of Science.

18. The highest authority for the organisation of science in Ukraine is:

- a) the Cabinet of Ministers of Ukraine;
- b) the National Academy of Sciences of Ukraine;
- c) the Ministry of Education and Science of Ukraine;
- d) the Verkhovna Rada of Ukraine.

19. State policy on scientific and scientific-technical activities is aimed at:

- a) ensuring the development of scientific creativity;
- b) increasing national wealth through the application of scientific and scientific-technical achievements;
- c) creating a market for scientific and scientific-technical products, and introducing scientific and technical achievements into all spheres of public life;
- d) stimulating scientific and scientific-technical creativity, invention and innovation.

20. What are the main types of experiments used in a teacher's research practice?

- a) descriptive, formative;
- b) preliminary, generalising;
- c) laboratory, formative;
- d) natural, monitoring.

LIST OF RECOMMENDED READING

Main

1. Відкриті наукові практики : навчальний посібник / за заг. ред. Жежнич П., Березка О. Житомир : ТОВ «Видавничий дім «Бук-Друк», 2024. 400 с.
2. Вітченко А. О., Вітченко А. Ю. Основи наукових досліджень у вищій школі : підруч. Київ : ФОП Ямчинський О.В., 2020. 272 с.
3. Дударев І., Кузьмін О. Практикум з методології наукових досліджень. Одеса: Олді+, 2023. 278 с.
4. Мальська М., Паньків Н. Основи наукових досліджень : навчальний посібник. Львів: Видавництво ЛНУ імені Івана Франка, 2020. 226 с.
5. Освітні науки: магістерський курс : навч. посіб. / Л. М. Потапук, Ю. Й. Тулашвілі, В. А. Кошелюк, О. І. Гулай / за заг. ред. Л. М. Потапук. Луцьк : Вежа-Друк, 2025. 312 с. ISBN 978-966-940-659-0
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8. Самсонов В.В., Сільвестров А.М., Тачиніна О.М. Методологія наукових досліджень та приклади її використання: Навч. посібник. К.:НУХТ, 2022. 385 с.
9. Hulai O. Interdisciplinary approach in pedagogical research: methodological foundations, challenges and prospects. Zhytomyr Ivan Franko State University Journal. Pedagogical Sciences. 2025. Vol.3(122). Pp. 36-53. [https://doi.org/10.35433/pedagogy.3\(122\).2025.3](https://doi.org/10.35433/pedagogy.3(122).2025.3).
10. Reproducibility and Replicability in Science. National Academies of Sciences, Engineering, and Medicine 2019. Washington, DC: The National Academies Press. <https://doi.org/10.17226/25303>..

Auxiliary

1. Гулай О. І., Карпюк А. Л. (2024). Soft i hard skills у процесі викладання та навчання. Актуальні проблеми в системі освіти: загальноосвітній заклад середньої освіти – доуніверситетська підготовка – заклад вищої освіти. 2024. 1(4). С. 248–256.
2. Гулай О.І. Особливості викладання дисципліни «Методологія наукових досліджень» // Сучасні інформаційні технології в освіті і науці : 3 Всеукр. наук. Інтернет-конф., 26-27 березня 2021 р. : (зб. матеріалів) / МОН України, Уманський держ. пед. ун-т імені Павла Тичини, Ін-т інформаційних технологій і засобів навч. НАПН України [та ін.] ; [редкол.: Медведева М.О. (голов. ред.), Ткачук Г.В., Жмуд О.В., [та ін.]. Умань : Візаві, 2021. С. 32-34.
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7. Назаровець С.А. Кількісний аналіз спільних публікацій українських науковців з нобелівськими лауреатами 1994—2018 рр. у окремих галузях науки. Наука та інновації. 2020. Т. 16, № 5. С. 110-117.
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9. Реалізація пріоритетних напрямів розвитку науки і техніки та отримані результати у 2021 р.: аналітична довідка / Т.В. Писаренко, Т.К. Куранда та ін. К.: УкрІНТЕІ, 2022. 53 с.
10. Програмна реалізація алгоритму розрахунку критерію манна-уїтні на мові с# [Текст] / В. М. Базурін, С. В. Базуріна // Актуальні питання природничо-математичної освіти : збірник наукових праць. Вип. 2 (24) / Міністерство освіти і науки України, Сумський державний педагогічний університет імені А. С. Макаренка ; [ред. рада.: М. І. Бурда, Л. В. Кондрашова, М. Гарнер, В. Б. Мілушев та ін.]. уми : [СумДПУ імені А. С. Макаренка], 2024. С. 122–130..
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<https://doi.org/10.30525/2500-946X/2024-1-5>.

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20. Prathapan, K. (2022). *Research Methodology for Scientific Research*, 2/E. IK International Pvt Ltd.
21. Theoretical foundations for increasing the research capacity of universities of Ukraine in the context of implementation of the “Open science” concept: preprint (analytical materials) Technical Report. Institute of Higher Education of NAES of Ukraine, Kyiv, Ukraine (2021).
22. The Essence of Science: What Is The Philosophy Of Science? 2023. <https://mindthegraph.com/blog/what-is-the-philosophy-of-science/>

Information resources

1. Офіційний веб-портал парламенту України. URL: <https://www.rada.gov.ua/>
2. Офіційний сайт Міністерства освіти і науки України. URL: <http://mon.gov.ua/>
3. Офіційний сайт Національної бібліотеки України імені В.І. Вернадського. URL: <http://www.nbuv.gov.ua/>
4. Пошукова система і база даних наукових цитувань Open Ukrainian Citation Index (OUCI). URL: <https://ouci.dntb.gov.ua/about/how-it-works/>.

APPENDICES

Examples of how to cite literary sources

1) A sample is provided in Ukrainian, formatted in accordance with the currently valid DSTU 8302:2015 'Information and documentation. Bibliographic references. General requirements and rules for compilation'.

2) A description in English following the Harvard style.

Book / monograph

Наулко В. І., Артюх Л. Ф., Горленко В. Ф. Культура і побут населення України. Київ: Либідь, 1993. 255 с.

Naulko, V.I., Artiukh, L.F. and Horlenko, V.F., 1993. *Kultura i pobut naselennia Ukrainy* [Culture and Life of the Population of Ukraine]. Kyiv: Lybid.

Корпоративні структури в національній інноваційній системі України / за ред. Л. І. Федулової. Київ: УкрІНТЕІ, 2007. 812 с.

Fedulova, L.I. ed., 2007. *Korporatyvni struktury v natsionalnii innovatsiinii systemi Ukrainy* [Corporate Structures in the National Innovation System of Ukraine]. Kyiv: UkrINTEI.

Сівашко Ю. Формування державної служби в Україні. Модерна нація: українець у часі і просторі / за ред. О. Мороз. Львів, 2001. С. 270–271.

Sivashko, Yu., 2001. Formation of Civil Service in Ukraine. In: *O. Moroz, ed. Moderna natsiia: ukrainets u chasi i prostori* [Modern Nation: Ukrainian in Time and Space]. Lviv, pp. 270–271.

Thesis and abstract

Константинов М. В. Ю. Лотман та візуальна семіотика другої половини ХХ ст. (історико-філософський аналіз): дис. ... канд. філософ. наук / Дніпр. нац. ун-т ім. Олеся Гончара. Дніпро, 2017. 266 с.

Konstantynov, M.V., 2017. Y. Lotman and the Visual Semiotics of the Second Half of the Twentieth Century (Historical and Philosophical Analysis). Ph.D. Dissertation. Oles Honchar Dniprovskiy National University.

Дениско П. В. Непрозорість знаків як проблема семіотичної естетики: автореф. дис. ... канд. філос. наук / Полтав. нац. техніч. ун-т ім. Юрія Кондратюка. Київ, 2011. 15 с.

Denysko, P.V., 2011. Opacity of Signs as a Problem of Semiotic Aesthetics. Abstract of Ph.D. Dissertation. Yurii Kondratiuk Poltava National Technical University.

Conference, seminar and forum proceedings

Чужиков А. В. Дуалістична природа сучасного медіа-ринку. *Стратегічні орієнтири розвитку економіки України*: матеріали Міжнар. наук.-практ. конф., м. Одеса, 6–7 жовт. 2017 р. / ОНУ імені І. І. Мечникова. Одеса, 2017. С. 188–190.

Chuzhykov, A.V., 2017. *Dualistychna pryroda suchasnoho mediarynku* [The Dual

Nature of the Modern Media Market]. In: Odessa National University named after I. I. Mechnikov, *Strategic Benchmarks for the Development of the Ukrainian Economy*, Proceedings of the International Conference, Odessa, October 6–7 2017. Odessa, pp. 188–190.

An article in a print magazine

Петренко Б. М. Політична провокація та політичний екстремізм в теорії і практиці суспільних відносин. *Філософія і політологія в контексті сучасної культури*. 2012. Вип. 3. С. 232–239.

Petrenko, B.M., 2012. Politychna provokatsiia ta politychnyi ekstremizm v teorii i praktytsi suspilnykh vidnosyn [Political Provocation and Political Extremism in the Theory and Practice of Social Relations]. *Filosofia i politolohiia v konteksti suchasnoi kultury*, issue 3, pp. 232–239.

Чужина І. Два кроки в напрямку до узбіччя (до творчого портрету режисера Дм. Богомазова). *Просценіум*. 2008. № 3. С. 58–71.

Chuzhynova, I., 2008. Dva kroky v napriamku do uzbichchia (do tvorchoho portretu rezhysera Dm. Bohomazova) [Two Steps Towards the Road (to the Creative Portrait of Director Dm. Bogomazov)]. *Prostsenium*, no. 3, pp. 58–71.

An article in an online journal

Біланюк О. П. Сучасний стан та перспективи розвитку міжнародного туризму в українсько-польських відносинах. *Економіка. Управління. Інновація*. 2012. № 2. URL: http://archive.nbuv.gov.ua/e-journals/eui/2012_2/pdf/12borypv.pdf (дата звернення: 16.07.2018).

Bilaniuk, O. P., 2012. Current State and Prospects of International Tourism Development in Ukrainian-Polish Relations. *Ekonomika. Upravlinnia. Innovatsiia*, [online] no. 2. Available at: <<http://www.ascusc.org/jcmc/vol5/issue2/>> [Accessed 16 July 2018].

Section of the website

Мігунова Т. С. Слово «телебачення» – це архаїзм. *Телекритика*: [сайт]. Київ, 2017. URL: <http://www.telekritika.ua/expert/2017-01-23/59463>. (дата звернення: 23.01.2018).

Mihunova, T.S., 2017. Slovo «telebachennia» – tse arkhaizm [The Word «Television» is Archaism]. *Telekrytyka*. Available at: < <http://www.telekritika.ua/expert/2017-01-23/59463>> [Accessed 23 January 2018].

Standards

ISO 690–2. Information and Documentation. Bibliographical References. Electronic documents. Geneva : International Standards 49 Office, 1998.

International Standards Office, 1998. ISO 690–2 Information and Documentation. Bibliographical References. Electronic documents. Geneva: ISO.

Source: Key requirements for compiling a bibliography in accordance with the new standards: methodological guidelines / compiled by: M. P. Hrebenuk, H. Z. Shevchuk. Lutsk: VIPPO, 2019. 60 pp.

RECOMMENDATIONS

on the prevention and detection of academic plagiarism in academic works (abstracts, theses, monographs, research papers, articles, etc.)

1. General provisions.

The legal basis for the Recommendations on the Prevention and Detection of Academic Plagiarism in Scholarly Works (abstracts, theses, monographs, research papers, articles, etc.) (hereinafter referred to as the 'Recommendations') is the Constitution of Ukraine, the laws of Ukraine 'On Copyright and Related Rights', 'On Education', 'On Scientific and Scientific-Technical Activity', 'On Scientific and Technical Information' and 'On Higher Education'.

The Recommendations use the terms defined in the aforementioned laws:

Plagiarism is the publication (in whole or in part) of another person's work under the name of a person who is not the author of that work (paragraph in Article 50 of the Law of Ukraine 'On Copyright and Related Rights').

Academic plagiarism is the publication (in whole or in part) of scientific (creative) results obtained by others as the results of one's own research (creative work) and/or the reproduction of published texts (published works of art) by other authors without acknowledging authorship (Article 42(4) of the Law of Ukraine 'On Education')

A scientific result is new scientific knowledge obtained in the course of fundamental or applied scientific research and recorded on information media. A scientific result may take the form of a report, a published scientific article, a scientific presentation, a scientific communication on research work, a monographic study, a scientific discovery, a draft regulatory act, a regulatory document or scientific and methodological documents, the preparation of which requires the conduct of relevant scientific research or contains a scientific component, etc. (paragraph 22 of Article 1 of the Law of Ukraine 'On Scientific and Scientific-Technical Activity').

Scientific and technical information – any information and/or data on domestic and foreign achievements in science, technology and manufacturing, obtained in the course of research, experimental design, design and technological development, manufacturing and public activities, which may be stored on physical media or recorded in electronic form (second paragraph of Article 1 of the Law of Ukraine 'On Scientific and Technical Information').

2. Types of academic plagiarism in scholarly works (abstracts, theses, monographs, research papers, articles, etc.).

2.1. Academic plagiarism is defined as:

The reproduction in the text of an academic work[1] – either verbatim, with minor alterations, or in translation – of text by another author (or authors), comprising at least one sentence, without citing the author(s) of the reproduced text.

The reproduction, in whole or in part, of another author's (or authors') text in a

scholarly work through paraphrasing or free retelling, without citing the author(s) of the reproduced text.

Reproducing in the text of a scholarly work quotations from third-party sources cited in another source, without specifying the exact source from which the quotation is taken.

Reproducing in the text of a scholarly work scientific and technical information (other than common knowledge) cited in another source, without specifying the source from which this information was taken.

Reproducing, in the text of a scholarly work, published works of art without indicating the authorship of these works of art.

3. Guidelines on preventing academic plagiarism in academic works (abstracts, theses, monographs, research papers, articles, etc.).

3.1. Any text fragment comprising one sentence or more, reproduced in an academic paper without alteration, with minor changes, or in translation from another source, must be accompanied by a reference to that source. Exceptions are permitted only for standard textual clichés that have no specific author and/or are in common usage.

3.2. If a paraphrase or free retelling in the text of a research paper of a text by another author (or authors) spans more than one paragraph, a reference (bibliographical and/or in-text) to the relevant text and/or its author(s) must appear at least once in each paragraph of the research paper, except for paragraphs consisting entirely of formulae, as well as numbered and bulleted lists (in the latter case, a single reference at the end of the list is permitted).

3.3. If a quotation from a particular source is cited from the original source, a reference to the original source must be included in the text of the academic paper. If a quotation is not cited from the original source, a reference to the immediate source of the quotation must be provided in the text of the academic paper ('quoted from: ').

3.4. Any scientific and technical information cited in the text of a research paper must be accompanied by a clear indication of the source from which the information was taken. Exceptions are permitted only for information that is common knowledge and recognised by the entire community of specialists in the relevant field. Where the text of a statutory instrument is used in a research paper, it is sufficient to state its title, date of adoption and, where applicable, the date of adoption of the latest amendments thereto or a new version.

3.5. Any published works of art reproduced in the text of a research paper must be accompanied by the names of the authors and the titles of these works of art (if known). Where works of the performing arts are used, the individual or collective performers (if known) should also be cited. If the authors/performers are unknown, it should be stated that they are unknown. Where it is impossible to identify the author, title and/or performers of a work, the source from which the reproduced work was taken must be cited.

4. Guidelines for identifying academic plagiarism in academic works (abstracts, theses, research papers, articles, etc.).

4.1. To establish a case of the type of academic plagiarism defined in clause 2.1 of these Recommendations, it is sufficient to establish the simultaneous presence of the following indicators:

the text of another author (or other authors) contains a text fragment, or one very similar to it, comprising more than one sentence, which is identical to that in the academic work under assessment (with the exception of standard textual clichés that are not attributable to any specific author and/or are in common usage);

this text by another author (or other authors) was created earlier than the academic work under assessment (or another text by the author of the academic work under assessment in which the same sentence or group of sentences appears)[2];

the author of the academic work under assessment does not cite this text by another author (or other authors), or cites it elsewhere (in the reference list, in another part of their work) in such a way that it is unclear to which specific sentence (or group of sentences) in the academic work under assessment the citation relates.

4. 2. To establish the type of academic plagiarism defined in clause 2.2 of these Recommendations, it is sufficient to establish the simultaneous presence of the following indicators:

(a) the academic work under assessment contains a reproduction (in whole or in part) of another author's (or authors') text through paraphrasing or arbitrary retelling:

up to the length of a paragraph without a reference to the author(s) of the reproduced text, or

exceeding one paragraph in length without a bibliographic and/or textual reference to the author(s) of the reproduced text at least once in each paragraph (except for paragraphs consisting entirely of formulae, as well as numbered and bulleted lists);

(b) the reproduced text by another author (or other authors) was created prior to the academic work under assessment (or another text by the author of the academic work under assessment that is identical in content).

4.3. To establish the type of academic plagiarism defined in clause 2.3 of these Recommendations, it is sufficient to establish the simultaneous presence of the following indicators:

the academic work under assessment contains five or more quotations from third-party sources, reproduced verbatim or almost verbatim as they appear in another source, without citing that other source as the source from which the relevant quotations were taken;

this other source was produced earlier than the academic work under assessment (or another text by the author of the academic work under assessment in which the same quotations are included);

the author does not cite this other source, or cites it elsewhere (in the reference list, in another part of their text) in such a way that it is unclear from the citation which specific quotations from third-party sources used by the author were actually taken from this source.

4.4 To establish a case of the type of academic plagiarism defined in clause 2.4 of these Recommendations, it is sufficient to establish the simultaneous presence of the following criteria:

the same scientific and technical information (other than that which is in the public domain) as that contained in the academic work under assessment has been published in another source;

this other source was created earlier than the scientific work under assessment (or another text by the author of the work containing the same scientific and technical information);

the author does not cite this other source, or cites it elsewhere (in the reference list, in another part of their text) in such a way that it is unclear from the citation exactly which scientific and technical information used in the work (other than that which is common knowledge) the author has taken from this source.

4.5. To establish a case of the type of academic plagiarism defined in clause 2.5 of these Recommendations, it is sufficient to establish the simultaneous presence of the following criteria:

previously published works of art have been used in the academic work under assessment;

the authors (and/or titles, performers, source) of these works of art are known;

the authors (and/or titles, performers, source) of these works of art are not cited in the academic work under assessment.

Source of information: <https://mon.gov.ua/storage/app/media/akredytatsiya/instruktsiya/1-11-8681-vid-15082018-rekomendatsii-shchodo-zapobigannya-akademichnomu-plagiatu.pdf>

Methodology of Scientific Research : Guidelines for practical sessions and independent study for students pursuing a second (Master's) level of higher education within the educational and professional programme 'Educational and Pedagogical Sciences (Inclusive Education)', field of study A: Education specialisation A1: Education full-time and part-time modes of study / Compiled by O.I. Hulai. Lutsk: LNTU, 2026. 34 p.

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