

SCIENTIFIC WORK ON THE TOPIC OF THE MASTER'S DISSERTATION. PART 2.

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Working program of the discipline (Syllabus)

Details of the discipline

Level of higher education	<i>Second (Master's)</i>
Branch of knowledge	<i>10 Natural sciences</i>
Specialty	<i>101 Ecology</i>
Educational program	<i>Ecology safety</i>
Status of discipline	<i>Normative</i>
Form of education	<i>full-time/remote/mixed</i>
Year of preparation, semester	<i>1 course, spring semester</i>
Scope of discipline	<i>2 /(60 hours)</i>
Semester control/ control measures	<i>Test</i>
Schedule of classes	<i>1 hours per week (1,0 hour Laboratory classes)</i>
Language of instruction	<i>Ukrainian</i>
Information about the course /teachers	<i>Laboratory: associate professor, Ph.D., associate professor Trembus Iryna Vitalyivna tivkpi@gmail.com</i>
Course placement	<i>http://www.eco-paper.kpi.ua/for-student</i>

Program of discipline

1. Description of the discipline, its purpose, subject of study and learning results

The credit module is used to prepare masters for the educational and professional program "Ecological safety", to lie down to the cycle of professional training, which allows you to determine the specifics of conducting scientific and advanced work, which is the main task of the training program in schools. For the effective implementation of the assignments, it is necessary for them to develop competencies from the methodology of scientific research and writing of master's work, even if the researcher is obliged to give significant respect to the design, organization and development of advanced methodology for the provision of scientific research work. Methodology can be changed depending on the problem, but the basic approach to the scientifically advanced work remains the same.

***The purpose of studying the discipline** the development the formation of a complex of knowledge among students, the reduction of that knowledge necessary for carrying out scientific and research work, directed towards the development of author's propositions for the development of a well-founded phenomenon or the process; development of skills of independent work, thorough understanding of how to study the methods of scientific knowledge in case of solving problems in the dissertation.*

*The credit module contributes to students' formation of the following **competencies**:*

- the ability to learn and master modern knowledge;*
- the ability to generate new ideas (creativity);*

- *the ability to search, process and analyze information from various sources;*
- *the ability to motivate people and move towards a common goal;*
- *the ability to develop and improve methods and technologies;*
- *the awareness at the level of the latest achievements necessary for research and / or innovation activities in the field of ecology, environmental protection and balanced nature management;*
- *the ability to use the principles, methods and organizational procedures of research and/or innovation activities;*
the ability to organize works related to the assessment of the environmental state, environmental protection and optimization of nature management, in conditions of incomplete information and conflicting requirements;
- *the ability to self-educate and improve skills based on innovative approaches in the field of ecology, environmental protection and balanced nature management;*
- *the ability to independently develop environmental projects by creatively applying existing and generating new ideas;*
- *the ability to assess the level of negative impact of natural and anthropogenic factors of ecological danger on the environment and people;*
- *the ability to develop a set of management solutions;*
- *the ability to collect and process information in order to obtain parameters characterizing the state of the environment.*

The subject of the discipline is the technologies, methods and techniques for carrying out research and development work and presentation of results.

*In accordance with the requirements of the educational, professional and educational-scientific program, students after mastering the discipline must demonstrate the **results of training**:*

- *to know and understand the fundamental and applied aspects of environmental sciences*
- *to be able to use conceptual environmental patterns in professional activities;*
- *to know at the level of the latest achievements the basic concepts of natural science, sustainable development and methodology of scientific knowledge;*
- *to demonstrate the ability to organize collective activities and implement complex environmental projects, taking into account available resources and time constraints;*
- *to be able to communicate in a foreign language in scientific, industrial and social spheres of activity;*
- *be able to convey professional knowledge, own justifications and conclusions to specialists and the general public clearly and unambiguously;*
- *know the principles of personnel and resource management, basic approaches to decision-making in conditions of incomplete/insufficient information and conflicting requirements;*
- *To demonstrate awareness of the latest principles and methods of environmental protection;*
- *to be able to use modern information resources on issues of ecology, nature management and environmental protection;*
To be able to assess landscape and biological diversity and analyze the effects of anthropogenic impact on the environment
- *to be able to assess the potential impact of man-made objects and economic activities on the environment;*
- *to apply new approaches to develop a decision-making strategy in complex, unpredictable conditions;*

- to assess environmental risks in the conditions of insufficient information and conflicting requirements;
- to choose the optimal management strategy and/or nature management depending on ecological conditions;
- to critically comprehend theories, principles, methods and concepts from various subject areas to solve practical problems and problems of ecology;
- to be able to use modern methods of processing and interpretation of information in innovative activities;
- to be able to independently plan the implementation of an innovative task and formulate conclusions based on its results;
- to have the basics of ecological engineering design and environmental expert assessment of the impact on the environment;
- to know modern approaches to the organization of environmentally friendly productions, reorganization and reconstruction of existing productions from the standpoint of resource conservation, taking into account the life cycle of the product;
- to analyze the results of environmental control of enterprises, evaluate the engineering and technical level of means of environmental protection against the harmful effects of production;
- to use scientific and technical information, regulatory documents, professional knowledge, apply methods of managing technological processes, equipment that ensure protection of water bodies, atmosphere, soil and subsoil from pollution and harmful emissions.

Credit module prerequisites and post-requisites (a place in the structural and logical scheme of training according to the relevant educational program)

Graduation of the credit module will be replaced by the first disciplines that graduated in the bachelor's degree and "Science work on the topic of the master's dissertation. Part 1. Fundamentals of scientific research.

Credit module "Science work on the topic of master's thesis. Part 2. Scientific and research work on the theme of the master's dissertation, ensuring the passage of pre-diploma practice, graduating and completing the master's thesis.

2. Content of the academic discipline

Topic 1.1 Conducted follow-up on the topic of master's thesis

Topic 1.2 Processing and formalizing the results of scientific research work

3. Educational materials and resources

Basic

1. Nosachova Yu.V., Ivanenko O.I., Radovenchik Y.V. *Fundamentals of scientific research*. Kyiv: Condor Publishing House, 2020. – 294 p. 130 p.
2. Kolesnikov O. V. *Fundamentals of scientific research*. – K.: TSNL, 2019. – 144 p.
3. Anatoliy Konversky. *Fundamentals of methodology and organization of scientific research*. – K.: TSNL, 2019. – 350 p.
4. Zatserkovny V.I., Tishaev I.V., Demidov V.K. *Methodology of scientific research. Education manual Nizhin NSU named after M. Gogol*, 2017. 236 p.

Auxiliary (d)

5. Cheryopkina R.I., Movchaniuk O.M. *Methodical instructions for the completion and design of a master's thesis*. Kyiv "KPI", 2014, - 54 p.

6. *Regulations on the master's degree of NTUU "KPI" / Agreement*. V.P. Golovenkin In general ed. Yu.I. Yakymenko Kyiv: VPK "Polytechnic" b 2007. - 27 p.

7. *Rules for creating links to archival documents in dissertations // Bulletin of the Higher Attestation Commission of Ukraine*. – 2010. - No. 3. - P. 17-20.

8. Birta G.O., *Methodology and organization of scientific research. Education manual Recommended by the Ministry of Education and Science of Ukraine*. K.: Center of Educational Literature, 2016. - 142 p.

9. *State standard of Ukraine. DSTU 8302:2015 Information and documentation. Bibliographic reference. General provisions and rules of drafting*.

Information resources on the Internet

<https://studfile.net/preview/6012352/>

<http://ukrlit.org/transliteratsiia#source=0jhqu9c+0yjquc40l3qsa==>

Scientometric databases. National Library of Ukraine named after V.I. Vernadskyi -

<https://www.nbu.gov.ua>

Educational content

4 Methods of mastering the discipline (educational component)

Laboratory classes

The main tasks of the cycle of laboratory classes: the deepening of theoretical knowledge and the acquisition of experimental skills during the execution of tasks on the topic of the master's thesis.

No s/p	The name of the laboratory work	Number of hours
1	Introduction, briefing on safety techniques, issuing tasks, issuing methodical instructions.	1
2	Research conducting on the subject of a master's thesis Literature: [1, 4 on the topic of the dissertation].	12
3	Processing and registration of the results of research work Literature: [1, 4 on the topic of the dissertation].	4
4	Protection of laboratory works	1
5	All hours	18

Independent work of the student

Independent work takes 70% of the time to study the credit module, including preparation for the test. The main task of independent work of students is the mastery of scientific knowledge, through personal search for information, the formation of an active interest in the creative approach in educational work.

No s/p	Name of the topic submitted for self-study	Number of hours of IWS
Section 1. Research work		
1	Carrying out research using theoretical and empirical methods. Literature: [1, 2, 4]. Scientific experiment. Proof of hypotheses. Formulation of conclusions and recommendations. Construction of the experiment. Control of the experiment. Interpretation of the results of the experiment.	36

	<i>Literature: [7, 8, 9]. Research results generalization. Literature: [5, 6, 9].</i>	
2	Test	6
	All hours	42

Politics and control

5. Policy of discipline (educational component)

Rules for attending classes and behavior in classes

Students are obliged to take an active part in the educational process, not to be late for classes and not to miss them without a good reason, not to interfere with the teacher to conduct classes, not to be distracted by actions that are not related to the educational process

Rules for assigning incentive and penalty points

- *incentive points can be awarded by the teacher exclusively for the performance of creative works in the discipline. (But their sum cannot exceed 10% of the rating scale).*
- *penalty points are not provided within the academic discipline.*

Policy of deadlines and rescheduling

In the event of arrears from the academic discipline or any force majeure circumstances, students should contact the teacher through the available (provided by the teacher) communication channels to resolve problematic issues and agree on the algorithm of actions for practice.

Academic Integrity Policy

Plagiarism and other forms of dishonest work are unacceptable. Plagiarism includes the absence of references when using printed and electronic materials, quotes, opinions of other authors. Invalid hints and write-offs when writing tests, conducting classes; passing the credit for another student; copying of materials protected by the copyright system without the permission of the author of the work.

The policies and principles of academic integrity are defined in Section 3 of the Code of Honor of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute". Read more: <https://kpi.ua/code>

Policy of academic behavior and ethics

Students should be tolerant, respect the opinion of others, object to formulate in the correct form, constructively maintain feedback in the classroom.

The norms of ethical behavior of students and employees are defined in Section 2 of the Code of Honor of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute". Read more: <https://kpi.ua/code>

6. Types of control and rating system for assessing learning outcomes (RCOs)

Distribution of teaching time by types of classes and tasks from the credit module according to the working curriculum

Form teaching	Semesters	Total ak/hour	Distribution of teaching time by type of classes				Control measures		
			Lecture	Practical classes	Laboratory work	IWS	MCW	CGW	Semester certification
Day/distress/mixed	spring	2/60		-	18	42	-	-	Test

* - in accordance with the number of students in the group, the number of lecture, practical and laboratory classes can be proportionally changed taking into account individual classes

The rating of the student from the credit module consists of the points he receives for:

The student's credit module rating is calculated from 100 points that the student receives for

1) 4 laboratory works execution and defense.

Semester control is test.

System of rating (weighted) points and evaluation criteria

System of rating points and evaluation criteria:

Laboratory work (max 100 points):

For the performance of each laboratory work you can get

25 points – the work is completed in full without errors, the protocol is correctly drawn up with relevant conclusions, the work is submitted for the defense in a timely manner, the student shows deep knowledge of the issues of the work, confidently and in detail answers the questions asked during the defense;

24-18 points – the work is completed in full with minor errors or inaccuracies, in general, the protocol is correctly drawn up with relevant conclusions, the work is submitted for defense in a timely manner, during the defense of the work, the student shows knowledge of the work, almost confidently answers the questions;

17-10 points - the work is completed in full with minor errors or inaccuracies with vaguely formulated conclusions, the work for defense is submitted on time, during the defense the student shows insecurity, shows weak knowledge of work issues, does not always give comprehensive answers to questions.

9-0 points – the work is not completed or not completed in full, the work does not have conclusions or they are declarative in nature, during the defense the student cannot answer any of the questions on the topic of the work.

At the beginning of each laboratory work, a control survey is conducted. In case of an unsatisfactory result of the control survey, the student is not allowed to perform laboratory work.

Thus, the rating semester scale for the academic discipline is:

$$R = 25 \bullet 4 = 100 \text{ points}$$

Calendar control:

It is held during the 8th and 14th weeks of the semester in order to monitor the implementation of individual study plans by students according to the schedule of the educational process.

The condition for receiving a positive assessment from the calendar control is the value of the student's current rating in the 8th week - 20 points, in the 14th week - 40 points.

A necessary condition for admission to credit is a rating of at least 40% of the rating scale (R), i.e. 40 points and the performance and defense of laboratory work.

In order to receive a credit in the academic discipline "automatic" you need to have a rating of at least 60 points.

Students who have a rating of less than 60 points at the end of the semester, as well as those who want to increase their grade in the ECTS system, perform a credit test. At the same time, points earned during the semester are cancelled. This rating is final. Students give answers to 5 questions during the assessment test.

Each test question (r1, r2, r3, etc.) is valued at 20 points according to the evaluation system:

- "excellent", complete answer (at least 90% of the required information) - 20 points;
- "good", sufficiently complete answer (at least 75% of the required information or minor inaccuracies) - 15...17 points;
- "satisfactory", incomplete answer (at least 60% of the required information and some errors) - 14...8 points;
- "unsatisfactory", an unsatisfactory answer - 0-7 points.

Maximum number of points $4 \times 20 = 100$ points

The sum of the points for each of the five questions of the test is converted into a credit score according to the table, and this rating score is final:

Scores	Rating
95...100	excellent
85...94	very good
75...84	good
65...74	satisfactory
60...64	enough
RD < 60	unsatisfactory
Admission conditions not met	not allowed

7. Additional information on the academic discipline (educational component)

Question for credit

1. Relevance of the research, its purpose and tasks.
2. To describe approximate solutions.
3. Specify the scope of applied research and its ultimate goal.
4. To give a description of the means of measurement.
5. Bring university scientific organizations.
6. To characterize research trainees as a form of training of scientific personnel.
7. Bring branch scientific organizations.
8. Describe the training of personnel in graduate school.
9. Describe the training of personnel in doctoral studies.
10. To characterize the generalization of the results of scientific work.
11. Describe the principle of determining the scientific and practical significance of the obtained research results.
12. Describe special research methods.
13. Describe special research methods.
14. Name the features of writing scientific articles.

15. Describe the algorithm for proposing a scientific hypothesis and its justification.

Work program of the discipline (syllabus):

Compiled by Associate Professor, Ph.D., Trembus I.V.

Approved by the Ecology and technology of plant polymers (protocol No 14 from 08.06.2022)

Approved by the CEF Methodical Commission (protocol No.10 of 24.06.2022_)