

Syllabus
educational component VK
(conditional marking OK in educational program (OP))

Methodology scientific of research

Name disciplines:	Methodology scientific of research
Level higher education:	the second (master's)
Page course in Moodle:	https://dl2022.khadi.kharkov.ua/course/view.php?id=2661
Amount educational component	3 loans (90 hours)
Form final control	Test
Consultations:	on schedule
Name departments:	chair technologies metals and materials science
Teaching language :	Ukrainian, english (if is)
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Short content educational component:

The goal and task of the academic discipline "Scientific Research Methodology" is the formation and development of a scientific worldview and students' acquisition of skills and competencies to set scientific tasks, plan their implementation, organize the collection and processing of information, create conditions for the generation of new ideas and their practical implementation.

Subject: theoretical and methodological foundations, methodological provisions of scientific directions in materials science at the current stage.

The main ones tasks study educational disciplines are:

mastery knowledge of the basics of scientific research is mandatory for specialists in materials science. The generation of young specialists in materials science should be distinguished by high competence and the ability to independently solve creative problems, the ability to expand basic knowledge, use in to apply everything new that appears in science and practice to his work the latest methods of work organization, scientific and special methods and models.

Prerequisites for study educational component:

Materials science, Scientific and research work of students, Foreign language (by professional direction)

Competencies, whose acquires getter:

general competences :

The ability to generate new ideas and implement them in the form of sound innovative solutions. Ability to find, process and analyze information from various sources.

Special (professional) competences:

The ability to perform scientific research, analyze and process the results of full-scale or model experiments, using regulatory documents, new hypotheses in the field of materials science, information technologies, software software. Ability perform literary search sources in professional field and critically evaluate published materials. Specialized knowledge of the latest methods and techniques of modeling, development and research of materials.

The results teaching in accordance to educational programs:

Know the basics of elements of theoretical and experimental research in professional activity. To be able to use the achievements of modern information technologies, to compile programs. To understand the principles of system analysis, cause-and-effect relationships between significant factors and scientific and technical decisions made when solving complex material science problems..

Thematic plan

Topic No	Name topics (LK, LR, PR, NW, SR)	Number hours
		ocular
1	2	3
1	LK TOPIC 1. Science how sociocultural phenomenon	2
	PR (LR, NW) Empirical, logical and theoretical cognitive task scientific research.	2
	SR History occurrence universities in the world and in Ukraine.	6
2	LK. TOPIC 2. Modern science and ethics scientific activity	2
	SR Science: prerequisites occurrence and stages development	6
3	LK TOPIC 3. Specifics scientific knowledge and cognition	2
	SR Scientific school, her signs and role in development science	8
4	LK TOPIC 4. Theoretical and empirical levels scientific research	2
	PR (LR, NW)) General scientific theoretical methods, analysis and synthesis, their types: empirical, elementary-theoretical, structurally - genetic.	4
	SR Scientific theories, their classification and role in development science	8
5	LK TOPIC 5. Methodology and methods scientific research	2
	PR (LR, NW) - "The main ones concept and definition of mathematical methods and methods statistical processing scientific data"	4
	SR Methods observation and poll in system collection information for research.	8
6	LK TOPIC 6. Organization scientific research	2
	PR (LR, NW) development and experimental checking the model, main ideas, conceptual provisions that laid down in basis research"	4
	SR Scientific activity and structure scientific research.	6
7	LK TOPIC 7. Scientific text and requirements to him	2
	PR (LR, NW) Machinery writing text scientific research	2
	SR Machinery writing text scientific research.	6
8	LK. TOPIC 8. Main types of scientific research. Preparation of qualification papers and their procedure protection	2
	Methods and criteria evaluations results scientific of research	8
Together	LK	16
	PR (LR, SZ)	16
	SR	58

Individual educational and research task (by available):

Methods teaching:

1) verbal: 1.1 traditional: lectures, explanation, story etc;

- 1.2 interactive (non-traditional): problematic lectures, discussions etc;
- 2) visual: method illustrations, method demonstrations
- 3) practical: 3.1 traditional: practical classes, seminars;
- 3.2 interactive (non-traditional): business and role players games, trainings, seminars- discussions, "round table", method brain attacks

System assessment and requirements:

Current performance

1 The current success of applicants for the performance of educational types of work in training sessions and for the performance of independent work tasks is evaluated using a four-point rating scale with subsequent transfer to a 100-point scale. During the evaluation of the current academic performance, all types of work provided for by the educational program are taken into account.

1.1 Lecture classes are evaluated by determining the quality of performance of specified tasks.

1.2 Practical classes are evaluated by the quality of performance of a control or individual task, performance and design of practical work.

1.3 Laboratory classes are evaluated by the quality of reports on the performance of laboratory work.

1.4 Seminar classes are evaluated by the quality of the performance of an individual task/abstract.

2 The current performance of higher education applicants is assessed at each practical session (laboratory or seminar) on a four-point scale ("5", "4", "3", "2") and entered in the journal of academic performance.

– "excellent": the winner mastered the theoretical material flawlessly, demonstrates deep knowledge of the relevant topic or academic discipline, the main provisions;

– "good": the applicant has mastered the theoretical material well, possesses the main aspects from primary sources and recommended literature, presents it in an argumentative manner; has practical skills, expresses his thoughts on certain problems, but certain inaccuracies and errors are assumed in the logic of the presentation of theoretical content or in the analysis of practical ones;

– "satisfactory": the applicant has basically mastered the theoretical knowledge of the educational topic or discipline, orients himself in primary sources and recommended literature, but answers unconvincingly, confuses concepts, answers additional questions uncertainly, does not have stable knowledge; when answering questions of a practical nature, reveals inaccuracy in knowledge, does not know how to evaluate facts and phenomena, connect them with the future profession;

– "unsatisfactory": the applicant has not mastered the educational material of the topic (discipline), does not know scientific facts, definitions, hardly orients himself in primary sources and recommended literature, lacks scientific thinking, practical skills are not formed.

3 Final mark by current activity is recognized how arithmetic mean sum points by each occupation, by individual work, current control work by the formula:

$$K^{nomoy} = \frac{K1 + K2 + \dots + Kn}{n},$$

where K^{nomoy} is the final assessment of success based on the results of current control;

$K1, K2, \dots, Kn$ – evaluation of the success n of the current control measure;

n – number of ongoing control measures.

O prices are converted into points according to the calculation scale (table 1).

Table 1 – Recalculation of the average grade for the current activity into a multi-point scale

4-point scale	100-point scale	4-point scale	100-point scale	4-point scale	100-point scale	4-point scale	100-point scale
5	100	4.45	89	3.90	78	3.35	67
4.95	99	4.4	88	3.85	77	3.3	66
4.9	98	4.35	87	3.80	76	3.25	65
4.85	97	4.3	86	3.75	75	3.2	64
4.8	96	4.25	85	3.7	74	3.15	63
4.75	95	4.20	84	3.65	73	3.1	62
4.7	94	4.15	83	3.60	72	3.05	61
4.65	93	4.10	82	3.55	71	3	60
4.6	92	4.05	81	3.5	70	from 1.78 to 2.99	from 35 to 59
						reassembly _	
4.55	91	4.00	80	3.45	69	from 0 to 1.77	from 0 to 34
4.5	90	3.95	79	3.4	68	repeated study	

Conclusive assessment

1 student of higher education receives a credit in the last lesson in the discipline based on the results of the current assessment. The average score for the current activity is converted into points on a 100-point scale, according to the conversion table (table 1). Getters higher education, which have average current assessment with disciplines lower than

"3" (60 points), in the last session can increase their current score by taking discipline tests .

Assessment of knowledge acquirers by testing is carried out according to the scale:

- "Perfectly": not Less 90 % correct ones answers;
- "Very okay": from 82 % to 89 % correct ones answers;
- "Okay": from 74 % to 81 % correct ones answers;
- "Satisfactorily": from 67 % to 73% correct ones answers;
- "Satisfactorily enough": from 60 % to 66 % correct ones answers;
- "Unsatisfactorily": Less 60 % correct ones answers

2 By condition receiving offset is:

- working out everyone missed occupations;
- average current rating with disciplines not lower "3" (60 points).

3 By implementation individual independent work and participation in scientific in events, additional points are awarded to winners.

3.1 Additional points are added to Sumy points recruited what do you do? higher education by

current educational activity (for disciplines for which the final form of control is a test), or to the final assessment in a discipline for which the final form of control is an exam.

3.2 The number of additional points awarded for different types of individual tasks depends on their volume and importance:

- prizes places with disciplines on international / All-Ukrainian contests scientific student works - 20 points;
- prizes places with disciplines on All-Ukrainian Olympics - 20 points;
- participation in international / All-Ukrainian contests scientific student works - 15 points
- participation in international / all-Ukrainian scientific conferences of students and young scientists – 12 points;
- participation in All-Ukrainian Olympiads with disciplines – 10 points
- participation in Olympiads and scientific conferences I'm looking for with disciplines – 5

points;

- performance of individual scientific and research (educational and research) tasks of increased complexity - 5 points .

3.3 Number additional points not maybe exceed 20 points

4 Result teaching is evaluated (*select required*) :

- by two-point scale (enrolled/not credited) according to with table 2;
- by 100-point scale (for differentiated offset) according to with table 3.

Final rating together with additional points not maybe exceed 100 points

Table 2 – Scale transfer points in national system assessment

By 100-point scale	By national scale
from 60 points up to 100 points	counted
Less 60 points	not counted

Table 3 – The scale for evaluating the knowledge of students based on the results of the final control of the academic discipline

Score in points	Assessment by national scale		Rating by the ECTS scale	
	examinati	test	Rating	Criteria
90-100	Perfectly	Enrolled	A	Theoretical content course mastered quite, without gaps necessary practical skills works with mastered material are formed, all provided for program teaching educational tasks completed, quality their performance was evaluated with a number of points close to the maximum
80–89	Okay	Enrolled	B	Theoretical content course mastered quite, without gaps necessary practical skills work with mastered material mainly formed, all provided by the training program educational task performed quality implementation the majority with them evaluated with a number of points close to the maximum
75–79			C	Theoretical content course mastered quite, without gaps, some practical skills of working with the mastered material are insufficiently formed, all educational tasks provided for in the training program are completed, the quality of execution of none of them is rated as minimal by number points some species tasks performed with mistakes
67–74	Satisfactorily		D	The theoretical content of the course is partially mastered, but the gaps are not of a significant nature, the necessary practical skills for working with the mastered material are basically formed, most of the educational tasks provided for by the training program have been completed, some with performed tasks, perhaps, contain mistakes

60–66			E	The theoretical content of the course is partially mastered, some practical work skills are not formed, many provided for educational tasks have not been completed by the training program, or quality implementation some with them evaluated by number points close ones to a minimum
35–59	Unsatisfactorily	Not counted	FX	The theoretical content of the course has been partially mastered, the necessary practical work skills have not been formed, majority provided for training programs of educational tasks have not been completed, or the quality of their implementation has been assessed with a number of points close to the minimum; with additional independent work over the course material can improve the quality of educational performance tasks (with possibility reassembly)
0–34	Unacceptable		F	The theoretical content of the course has not been mastered, the necessary practical work skills are not formed, all completed educational tasks contain gross errors, additional independent work on the course material will not lead to any significant improvement in the quality of performance educational tasks (with mandatory repeated course)

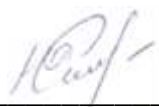
Policy course:

- the course involves working in a team, the environment in the classroom is friendly, creative, open to constructive criticism;
- mastering the discipline involves mandatory attendance at lectures and practical classes, as well as independent work;
- independent work involves the study of individual topics of the academic discipline, which are presented in accordance with the program for independent study, or were considered briefly;
- everyone task, provided for program, have be performed in installed term;
- if the student of higher education is absent from classes for a valid reason, he presents the completed tasks during independent preparation and consultation of the teacher;
- coursework must be protected no later than a week before the beginning of the examination session (**indicated if available**) ;
- while studying the course, students of higher education must comply with the rules of academic integrity set forth in the following documents: "Rules of academic integrity of participants in the educationa process of the Khnadu" (https://www.khadi.kharkov.ua/fileadmin/P_Standart/pologeniya/stvnz_67_01_dobroch_1.pdf), "Academic integrity. Checking the text of academic, scientific and qualification papers on plagiarism" (https://www.khadi.kharkov.ua/fileadmin/P_Standart/pologeniya/stvnz_85_1_01.pdf), "Moral and ethical code of participants in the educational process of the Khnadu" (https://www.khadi.kharkov.ua/fileadmin/P_Standart/pologeniya/stvnz_67_01_MEK_1.pdf).
- in case of detection of plagiarism, the applicant receives 0 points for the task and must repeat the tasks provided for in the syllabus;
- writing off during tests and exams is prohibited (including using mobile devices). Mobile devices are allowed to be used only during online testing.

Recommended literature: (literature no later than 10 years old, except for 1 fundamental classical textbook or monograph)

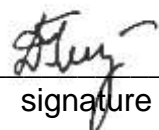
1. Constitution of Ukraine : Law of Ukraine from 28.06.1996 p. No 254k/96- VR.URL : <http://zakon.rada.gov.ua/laws/show/254>
2. Civil code of Ukraine : Law of Ukraine from 16.01.2003 p. No 435- IV.URL: <http://zakon.rada.gov.ua/laws/show/435-15>
3. About author's right and adjacent rights : Law of Ukraine from 23.12.1993 p. No. 3793-XII. URL: <http://zakon.rada.gov.ua/laws/show/3792-12>
4. About information : Law of Ukraine from 02.10.1992 p. No 2657-XII.URL: <http://zakon.rada.gov.ua/laws/show/2657-12>
5. About scientific and scientific and technical activity : Law of Ukraine from 26.11.2015 p. No. 848-VIII. URL: <http://zakon.rada.gov.ua/laws/show/848-19>
6. About scientific and scientific and technical examination : Law of Ukraine from 10.02.1995 p. No 51/95-VR.URL: <http://zakon.rada.gov.ua/laws/show/51/95>
7. About protection rights on inventions and useful models : Law of Ukraine from 15.12.1993 No. 3687-XII.URL: <http://zakon.rada.gov.ua/laws/show/3687-12>
8. About protection rights on designation origin goods : Law of Ukraine dated 16.06.1999 No. 752-XIV.URL: <http://zakon.rada.gov.ua/laws/show/752-14>
9. About protection rights on signs for goods and services : Law of Ukraine dated 12/15/1993 No. 3689-XII.URL: <http://zakon4.rada.gov.ua/laws/show/3689-12>
10. Bern convention with protection literary and artistic works dated April 24, 1971. URL: http://zakon4.rada.gov.ua/laws/show/995_051.
11. Antoshkina L.I., Stechenko D.M. Methodology economic of research : Textbook. K.: Znannia, 2015. 311 p.
12. Artemchuk G.I., Smoked V.M., Kochergan M.P. Method organizations scientific research work: teaching. manual Kyiv: KDLU Forum, 2014. 270 p.
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15. Beluga M.T. Foundations scientific of research K. : Higher school, 2011. 271 with.
16. Birta H.O., Burg Yu.G. Methodology and organization scientific research : Tutorial. K.: "Center for Educational Literature", 2014. 142 p.
17. Vazhinsky S.E., Shcherbak THOSE. Method and organization scientific of research : Education manual Sumy : SumDPU name A.S. Makarenko, 2016. 260 with.
18. Galaeva L.V. Methodology systemic approach and scientific of research K. : NUBiPUkraine, 2014. 94 p.

Developer(s)
syllabus of the educational
discipline


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