

**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
LVIV POLYTECHNIC NATIONAL UNIVERSITY**

« APPROVE»

Rector

Lviv Polytechnic National University

_____/ Bobalo Yu.Ya./

« ____ » _____ 2021

EDUCATIONAL AND SCIENTIFIC PROGRAM

third (educational and scientific) level of higher education

majoring in *Chemistry* 102

fields of knowledge 10 *Natural sciences*

Qualification: Doctor of Philosophy in *Chemistry*

Considered and approved
Academic Council of the
University
(protocol №. ____
from " __ " _____ 2021)

Lviv 2021

Developed by a working group by speciality **102 Chemistry** as part of:

Head of the working group (guarantor): Serheyev V.V. - doctor of chemical sciences, prof., professor of the Department of Physical, Analytical and General Chemistry

Members:

- Dibrivnyi V.M. - doctor of chemical sciences, prof., professor of the Department of Physical, Analytical and General Chemistry
- Lubynets V.I. - doctor of chemical sciences, prof., head of the Department of technology of biologically active compounds, pharmacy and biotechnology;
- Donchak V.A/ - doctor of chemical sciences, prof., head of the Department of Organic Chemistry
- Budishevskya O.G. - doctor of chemical sciences, prof., professor of the Department of Organic Chemistry
- Levytski V.E. - doctor of chemical sciences, prof., professor of the Department of of Chemical Technology of Plastics
- Bratyshchak M.M. - doctor of chemical sciences, prof., head of the Department of of Chemical Technology of Oil and Gas Processing
- Shapoval P.Yo. - doctor of chemical sciences, prof., head of the Department of Physical, Analytical and General Chemistry
- Kurka M.S. - Associate Professor of the Department of technology of biologically active compounds, pharmacy and biotechnology, PhD.
- Orobchuk O.M. -Associate Professor of the Department of Technology of Organic Products, Head of the Scientific Society of students, postgraduates, doctoral students and young scientists ICCT, Ph.D.
- Stasyuk A. -postgraduate student in the 3rd year of study in the speciality 102 Chemistry
- Maykovych O. postgraduate student in the 2nd year of study in the speciality 102 Chemistry
- Reshetnyak O. V. - doctor of chemical sciences, prof., head of the Department of of physical and colloidal chemistry of Ivan Franko Lviv National University
- Sojka L.D. -vice-rector of the Lviv Medical Academy, Ph.D.
- Telehiy A. V. -deputy head of the collegium and professional bureau of students of the Educational and Scientific ICCT
- Kiyayeva S. -Student of the Institute of Chemistry and Chemical Technologies

Guarantor _____ doctor of chemical sciences., prof. Serheyev V.V.

Approved and put into effect by order of the Rector of the National University "Lviv Polytechnic" dated " ____ " _____ 2021 №. _____.

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LETTER OF AGREEMENT
educational and scientific program

The level of higher education	the third (educational and scientific)
The branch of knowledge	10 <i>Natural sciences</i>
The speciality	102 <i>Chemistry</i>
The qualification	The Doctor of Philosophy

APPROVED

Scientific and methodical commission of
the specialty 102 *Chemistry*

Protocol № _____

since « _____ » _____ 2021 p.

The head of the EMC of the specialty
102 *Chemistry*

_____ Shapoval P.Yo.

« _____ » _____ 2021 p.

Director of Institute of Chemistry and
Chemical Technologies

_____ Skorokhoda V.Y.

« _____ » _____ 2021 p.

RECOMMENDED

Scientific and methodological council of
the university

Protocol № _____

since « _____ » _____ 2021 p.

The head of the EMD

_____ Zagorodniy A.G.

AGREED

The head of the educational and
methodical department

_____ Sviridov V.M.

« _____ » _____ 2021 p.

Vice-Rector for Scientific Research of
Lviv Polytechnic National University

_____ Demydov I.V.

« _____ » _____ 2021 p.

Vice-Rector for Graduate Education of
Lviv Polytechnic National University

_____ Davydchak O.R.

« _____ » _____ 2021 p.

I. EDUCATIONAL COMPONENT OF THE EDUCATIONAL AND SCIENTIFIC PROGRAM

Doctor of Philosophy program profile from the field of knowledge 10 *Natural sciences* majoring in Chemistry 102

1 - General information	
1	2
Full name of the higher education institution and structural division	Lviv Polytechnic National University
The full title of the qualification in the original language	Doctor of Philosophy in Natural Sciences by Speciality of Chemistry
The official name of the educational program	Chemistry
Type of diploma and scope of the educational program	Diploma of Doctor of Philosophy, single, 43 ECTS credits, the term of the educational component of the educational-scientific program is 2 years
Cycle/level	NRK of Ukraine – 8th level, FQ-EHEA – third cycle, EQF-LLL – 8th level
Prerequisites	Degree of higher education "Master"
Language(s) of instruction	Ukrainian language
Basic concepts and their definitions	The educational and scientific program uses the main concepts and definitions by the Law of Ukraine "On Higher Education" dated 07/01/2014 No. 1556-VII as amended, the Law of Ukraine "On Scientific and Scientific and Technical Activities" dated 11/26/2015 r. No. 848-VIII with amendments and additions, Procedure for the preparation of higher education applicants for the degree of Doctor of Philosophy and doctor of science in higher educational institutions (scientific institutions), approved by the Resolution of the Cabinet of Ministers dated 23.03.2016 No. 261, Provisions on the accreditation of educational programs for the training of higher education applicants, approved by order of the Ministry of Education and Science of Ukraine dated 11.07.2019 No. 977
2 – The purpose of the educational and scientific program	
	To deepen theoretical knowledge and practical abilities and skills in the field of Natural Sciences with a specialty in Chemistry, to develop philosophical and linguistic competences, to form universal skills of a researcher, sufficient for conducting and successfully completing scientific research and further professional and scientific activities.
3 – Characteristics of the educational and scientific program	
Subject area (field of knowledge, speciality)	Field of knowledge 10 <i>Natural sciences</i> , speciality 102 <i>Chemistry</i>
Orientation of the educational program	The educational and scientific program is based on the fundamental postulates of ecology and the results of modern scientific research. It aims to develop the theoretical-methodological and methodological-applied base of ecology with an accentuation on the latest trends in the development of ecology, which deepens the professional, scientific worldview and provides the basis for conducting scientific research and further professional and scientific activities.

1	2
Features of the program	The educational and scientific program covers a wide range of modern innovative vectors of the development of the theory and practice of chemistry, which forms an updated theoretical and applied base for conducting scientific research
4 – Eligibility of graduates of the educational and scientific program to employment and further education	
Suitability for employment	Jobs in public and private higher education institutions, scientific and research institutions as teachers and researchers, in enterprises and organizations of various types of activities and forms of ownership in managerial positions
Further education	Completion of the scientific program of the fourth (scientific) level of higher education for obtaining the degree of Doctor of Science
5 – Teaching and assessment	
Teaching and learning	A combination of lecture, laboratory and practical classes, a pedagogical workshop, consulting with a scientific supervisor, a scientific and pedagogical community with independent scientific and educational work
Assessment	Exams, assessments, current control
6 – Software competencies	
Integral competence (INT)	The ability to produce innovative scientific ideas, to master the methodology of scientific and pedagogical activity, to solve complex problems in the process of innovative research and professional activity, to conduct original scientific research at the international and national level.
General competences (GC)	<ol style="list-style-type: none"> 1. Gaining an in-depth understanding of the theoretical foundations and applied principles of chemistry, understanding of modern trends in the development of chemical science. 2. Mastery of general scientific (philosophical) competences aimed at forming a systematic scientific outlook, professional ethics and a general cultural outlook. 3. The ability to initiate and conduct original scientific research, identify relevant scientific problems, search for and critically analyze information, produce innovative constructive ideas, and apply non-standard approaches to solving complex and atypical tasks. 4. Acquisition of language competences sufficient to present and discuss the results of one's scientific work in Ukrainian and foreign languages in oral and written form, as well as to fully understand foreign-language scientific texts in one's specialty. The ability to present and discuss the results of scientific research in English orally and in writing, to read fluently and fully understand English-language scientific texts. 5. Acquisition of universal skills of a researcher, in particular, organization and conduct of training sessions. The ability to be purposeful and persistent, to self-improve throughout life, to be aware of social and moral responsibility for the obtained scientific results. 6. The ability to initiate, justify and manage actual scientific projects of an innovative nature, to independently conduct scientific research, to interact in a team and to show leadership skills in the implementation of scientific projects.

1	2
Special (professional) competences (SC)	<ol style="list-style-type: none"> 1. In-depth understanding of the peculiarities of chemical processes and phase transformations from the point of view of chemical thermodynamics. Understanding the influence of the structure of substances on their individual properties and reactivity. 2. Deep understanding of processes of organic synthesis, mechanisms of chemical reactions, prediction of properties of new promising products of organic synthesis. 3. In-depth understanding of modern methods of analysis of organic and inorganic substances, research of their chemical composition, structure and properties. 4. Understanding of modern scientific theories and methods of synthesis of biologically active compounds and medicines, their identification, control of benign quality and purity. 5. In-depth understanding of the physical and chemical action of cavitation; creation of conceptual principles of application of cavitation for real processes. 6. Understanding the scientific basis of the process of heterogeneous catalysis; forecasting and purposeful selection of effective catalytic systems. 7. In-depth understanding of the essence of petrochemical processes and methods of obtaining raw materials from petroleum products. 8. In-depth understanding of the theoretical foundations of establishing the supramolecular structure, chemical structure, conformational changes, phase and physical transitions of polymers. 9. In-depth understanding of the essence of processes occurring on the surface of phase separation and in dispersed systems.
7 – Program learning outcomes	
Knowledge (KN)	<ol style="list-style-type: none"> 1. In-depth knowledge of thermodynamics of chemical processes and phase transformations. 2. In-depth knowledge of the patterns connecting the structure of chemical compounds with their properties and reactivity. 3. Knowledge of theoretical and applied problems of modern organic chemistry and methods of organic synthesis. 4. In-depth knowledge of modern methods of identification, determination of composition and establishment of the structure of chemical compounds. 5. In-depth knowledge of the regularities of processes in the presence of heterogeneous catalysts; the relationship between the nature and activity of catalysts and reagents, the kinetics and mechanism of individual stages of the process. 6. In-depth knowledge of theoretical foundations and patterns of petrochemical processes. 7. In-depth knowledge of the theoretical foundations and patterns of cavitation processes, the impact of chemicals on ecosystems. 8. Basic knowledge and understanding of the philosophical methodology of cognition, the key principles of professional ethics, the system of moral and cultural values. Knowledge of psychological and pedagogical aspects of professional and scientific activity, own scientific outlook. 9. Knowledge of a foreign language, necessary for oral and written presentation of the results of scientific research, conducting professional scientific dialogue, full understanding of foreign scientific texts. 10. . In-depth knowledge of the theoretical foundations and patterns of processes in the surface layer and in dispersed systems.

1	2
Skills (SK)	<ol style="list-style-type: none"> 1. Apply acquired knowledge from various subject areas of chemistry to formulate and justify new theoretical propositions and practical recommendations in a specific area of research. The ability to independently process the results of scientific research and calculate them using analytical and numerical methods. 2. Apply modern methods of analysis to establish the molecular structure and identify synthesized compounds, study the kinetics and mechanism of chemical reactions. 3. The ability to plan and carry out the functionalization of organic compounds, determine the choice of optimal methods of obtaining and process parameters, manage their implementation, using methods of organic synthesis. 4. Apply knowledge about the laws of the relationship between the chemical structure and physical, chemical and pharmacological properties when solving theoretical and applied problems in the creation of new medicinal products. 5. Choose and apply the required petrochemical process to obtain a given monomer or other chemical substance. 6. Apply knowledge of chemical thermodynamics to real processes, predict thermodynamic properties and reactivity of substances. 7. The ability to demonstrate oratory and rhetorical skills when presenting the results of scientific research, to conduct a professional scientific conversation and debate with the wider scientific community and the public in Ukrainian and English, to form scientific texts in written form, to organize and conduct training sessions, in particular with the use of modern information technologies (work with VNS, Microsoft Teams, Zoom, etc.). Conduct classes using the results of your scientific work. 8. Management of scientific projects and/or preparation of proposals for funding of scientific research, registration of intellectual property rights, application of modern information technologies. 9. Application of modern information technologies in scientific activity and presentation of the results of one's work (work with NMBD, automatic generation of links to literary sources)
Communication (COM)	<ol style="list-style-type: none"> 1. The ability to communicate in business scientific and professional language, to use different speech styles, communication methods and techniques, to demonstrate a wide scientific and professional vocabulary. 2. The ability to use modern information and communication tools and technologies to ensure effective scientific and professional communications.
Autonomy and responsibility (A&R)	<ol style="list-style-type: none"> 1. The ability to independently conduct scientific research and make decisions. 2. The ability to formulate one's own author's conclusions, proposals and recommendations. 3. The ability to realize and bear personal responsibility for the obtained research results.

1	2
8 – Resource support for program implementation	
Specific characteristics of personnel support	100% of scientific and pedagogical workers involved in teaching professionally oriented disciplines, have scientific degrees in their specialty and are recognized professionals with experience in research, management or innovative work in their specialty.
Specific characteristics of material and technical support	Use of modern chemical equipment and software.
Specific characteristics of informational and methodical support	The use of the virtual learning environment of the National University "Lviv Polytechnic" and author's developments of the teaching staff.
9 – Academic mobility (regulated by CMU Resolution No. 579 "On Approval of the Regulation on the Procedure for Realizing the Right to Academic Mobility" dated August 12, 2015)	
National credit mobility	On the basis of bilateral agreements between Lviv Polytechnic National University, universities of Ukraine, institutes of the National Academy of Sciences of Ukraine.
International credit mobility	As part of the EU Erasmus + program on the basis of bilateral agreements between Lviv Polytechnic National University and educational institutions of partner countries
Education of foreign students of higher education	It is possible, after studying the Ukrainian.

2. Distribution of content of the educational component of the educational and scientific program by component groups and preparation cycles

№ in/or.	Training cycle	The volume of the educational load of the student of higher education (credits / %)		
		Common components of the educational and professional program	Elective components of the educational and professional program	Total for the entire period of study
1.	Cycle of disciplines that form general scientific competences and universal skills of the researcher	21/49	3/7	24/56
2.	Cycle of disciplines forming professional competences	10/23	6/14	16/37
3.	Cycle of subjects of free choice of a graduate student	–	3/7	3/7
Total for the entire period of study		31/72	12/28	43/100

3. List of components of the educational component of the educational and scientific program

Code n/a	Components of the educational component	Number of credits	Final control form	Competences provided for by Resolution 261 of 23.03.2016. (with changes from 03.04.2019)
1	2	3	4	5
1. Mandatory components of the educational component				
<i>1.1. Cycle of disciplines that form general scientific competences and universal skills of the researcher</i>				
<i>Cycle of disciplines that form general scientific competences and universal skills of the researcher</i>				
MD1.1.	Philosophy and methodology of science	3	exam	Mastering general scientific (philosophical) competences aimed at forming a systematic scientific outlook, professional ethics and a general cultural outlook; application of modern information technologies in scientific activities (work with NMBD, automatic formation of links to literary sources)
MD 1.2.	Foreign Language for Academic Purposes, Part 1	4	test	Acquisition of linguistic competences sufficient to present and discuss the results of one's scientific work in a foreign language in oral and written form, as well as to fully understand foreign language scientific texts in the relevant specialty, use of modern information technologies (presentation of scientific results).
MD 1.3.	Foreign Language for Academic Purposes, Part 2	4	exam	
MD 1.4.	Professional pedagogy	3	test	Acquisition of universal skills of a researcher, in particular, organization and conduct of training sessions, use of modern information technologies (work with VLE, Microsoft Teams, Zoom, etc.)
MD 1.6.	Academic entrepreneurship	4	test	Acquisition of universal skills of a researcher, in particular, oral and written presentation of the results of one's own research in Ukrainian, management of scientific projects and/or preparation of proposals for financing scientific research, registration of intellectual property rights, application of modern information technologies.
MD 1.7.	Pedagogical practice	3	test	Acquisition of universal skills of a researcher, in particular, organization and conduct of training sessions, use of modern information technologies (working with VLE, Microsoft Teams, Zoom, etc.).
Total per cycle:		21		

1	2	3	4	5
<i>1.1. Cycle of disciplines forming professional competences</i>				
MD 2.1	Analytical and numerical research methods	4	exam	Acquiring in-depth knowledge of the specialty in which the graduate student conducts research, in particular mastering the main concepts, understanding theoretical and practical problems, the history of development and the current state of scientific knowledge in the chosen specialty, mastering the terminology of the researched scientific direction in the amount of ECTS credits in accordance with the standard of higher education.
MD 2.2.	Research methods in chemical thermodynamics	3	test	
MD 2.3.	Research seminar on modern organic chemistry	3	test	
Total per cycle:		10		
2. Optional components of the educational component**				
<i>2.1. Cycle of disciplines that form general scientific competences and universal skills of the researcher</i>				
OD1.1	Business Foreign Language	3	diff. test	<p>Acquisition of universal skills of a researcher, in particular, oral and written presentation of the results of one's own research in Ukrainian, management of scientific projects and/or preparation of proposals for financing scientific research, registration of intellectual property rights, application of modern information technologies.</p> <p>Acquisition of linguistic competences sufficient to present and discuss the results of one's scientific work in a foreign language in oral and written form, as well as to fully understand foreign language scientific texts in the relevant specialty, use of modern information technologies (presentation of scientific results).</p> <p>Mastering general scientific (philosophical) competences aimed at forming a systematic scientific outlook, professional ethics and a general cultural outlook; application of modern information technologies in scientific activities (work with NMBD, automatic formation of links to literary sources)</p> <p>Acquisition of universal skills of a researcher, in particular, organization and conduct of training sessions, use of modern information technologies (working with VLE, Microsoft Teams, Zoom, etc.).</p>
OD1.2	Psychology of creativity and invention	3	diff. test	
OD1.3	Management of scientific projects	3	diff. test	
OD1.4	Technology of registration of grant applications and patent rights	3	diff. test	
OD1.5	Rhetoric	3	diff. test	
OD1.6	Modern inventions in research activities	3	diff. test	
OD1.7	Open scientific practices	3	diff. test	
OD1.8	Academic integrity and quality of education	3	diff. test	
OD1.9	Methodology of preparation of scientific publications	3	diff. test	
OD1.10	Quality of higher education (formation of internal quality assurance systems)	3	diff. test	
Total per cycle:		3		

1	2	3	4	5
<i>2.2. Cycle of disciplines forming professional competences</i>				
OD2.1	Theories of solutions and phase equilibrium	3	exam	Acquiring in-depth knowledge of the specialty in which the graduate student conducts research, in particular, mastering the main concepts, understanding theoretical and practical problems, the history of development and the current state of scientific knowledge in the chosen specialty, mastering the terminology of the researched scientific direction.
OD2.2	Methods of subtle organic synthesis	3	exam	
OD2.3	Pharmaceutical and medical biochemistry	3	exam	
OD2.4	Basics of cavitation chemistry	3	exam	
OD2.5	Heterogeneous catalysis	3	exam	
OD2.6	Modern instrumental methods of analysis of inorganic substances	3	exam	
OD2.7	Basics of petrochemicals	3	exam	
OD2.8	Modern methods of identification of organic compounds	3	exam	
OD2.9	Scientific basis of research of high molecular weight compounds	3	exam	
OD2.10	Surface phenomena and dispersed systems	3	exam	
Total per cycle:		6 (3+3)		
3. Disciplines of the graduate student's free choice **				
OD3.1	Discipline of the graduate student's free choice**	3	diff. test	Acquiring skills of critical analysis, evaluation and synthesis of new and complex ideas
Total per cycle:		3		
TOTAL		43		

Note: * - pedagogical practicum can take place in the II or III year of study;

** - a graduate student can choose disciplines from point 2, point 3 (selective and free choice), while the share of these subjects must be at least 25% of the total number of ECTS credits

4. Matrix of correspondence of program competencies to educational components

	MD1.1	MD1.2	MD1.3	MD1.4	MD1.5	MD1.6	MD2.1	MD2.2	MD2.3	OD1.1	OD1.2	OD1.3	OD1.4	OD1.5	OD1.6	OD1.7	OD1.8	OD1.9	OD1.10	OD2.1.	OD2.2.	OD2.3.	OD2.4.	OD2.5.	OD2.6.	OD2.7.	OD2.8	OD2.9	OD2.10	
INT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
GC1	•						•	•	•					•						•	•	•	•	•	•	•	•	•	•	•
GC 2	•										•	•	•		•	•	•													
GC 3					•		•				•	•			•	•		•		•	•	•	•	•	•	•	•	•	•	•
GC 4		•	•	•		•				•				•																
GC 5				•	•	•					•	•	•		•	•	•	•		•										
GC 6					•						•	•	•			•				•	•	•	•	•	•	•	•	•	•	•
SC1							•	•	•											•	•									
SC2							•		•												•				•		•			
SC3								•																			•			
SC4									•												•	•								
SC5								•															•							
SC6								•																•						
SC7									•																	•				
SC8								•																				•		
SC9								•																					•	

Conventional designations: MDi – mandatory discipline, ODi – optional discipline, i – discipline number in the list of components of the educational component, INT – integral competence, GCj – general competence, SCj – professional competence of the speciality, j – competence number in the list of competencies of the educational component.

5. Matrix of provision of software learning outcomes with relevant components educational component

	MD1.1	MD1.2	MD1.3	MD1.4	MD1.5	MD1.6	MD2.1	MD2.2	MD2.3	OD1.1	OD1.2	OD1.3	OD1.4	OD1.5	OD1.6	OD1.7	OD1.8	OD1.9	OD1.10	OD2.1.	OD2.2.	OD2.3.	OD2.4.	OD2.5.	OD2.6.	OD2.7.	OD2.8	OD2.9	OD2.10	
KN1								•												•										
KN 2							•	•	•												•	•			•		•	•		
KN 3									•												•									
KN 4							•																		•		•			
KN 5								•																•						
KN 6									•																	•				
KN 7								•															•							
KN 8	•			•	•	•					•	•	•		•	•	•	•	•				•							
KN 9		•	•							•				•				•												
KN 10								•																					•	
SK1	•				•		•	•	•		•	•	•		•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
SK 2									•																•		•			
SK 3									•																•			•		
SK 4								•	•													•								
SK 5									•																	•				
SK 6								•																						
SK 7		•	•	•	•	•	•			•	•	•	•	•	•		•		•											
SK 8					•										•															
SK 9					•		•				•	•						•												
COM1	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•												
COM2				•	•	•	•					•	•		•	•		•												
A&R 1	•				•		•	•	•		•	•	•		•			•		•	•	•	•	•	•	•	•	•	•	
A&R 2					•							•	•		•	•		•												
A&R 3					•							•	•		•	•		•												

Notations: MDi – mandatory discipline, ODi – optional discipline, i – discipline number in the list of components of the educational component, PHm – program results (knowledge and skills), m – number of the program result in the list of program results of the educational component.

II. THE SCIENTIFIC COMPONENT OF THE EDUCATIONAL AND SCIENTIFIC PROGRAM

The scientific component of the educational-scientific program involves the post-graduate student conducting his own scientific research under the guidance of one or two academic supervisors and the preparation of his results in the form of a dissertation.

The dissertation for obtaining the degree of Doctor of Philosophy is an independent comprehensive study that offers a solution to an actual scientific and applied task in the specialty 102 Chemistry, the results of which are characterized by scientific novelty and practical value and are published in relevant publications.

The scientific component of the educational-scientific program is drawn up in the form of an individual plan of scientific work of a postgraduate student and is an integral part of the postgraduate study plan.

An integral part of the scientific component of the postgraduate educational and scientific program is the preparation and publication of scientific articles, speeches at scientific conferences, scientific professional seminars, round tables, and symposia.

Topics of scientific research in the specialty 102 Chemistry:

1. Study of thermodynamic properties of individual organic substances and their solutions.
2. Synthesis and research of new promising biologically active compounds based on sulfur- and nitrogen-containing derivatives of aliphatic, carbocyclic and heterocyclic structures.
3. Synthesis of derivative compounds of natural origin and their transformation.
4. Construction of macromolecules of pseudopolyamino acids for monitoring the delivery and release of therapeutic drugs.
5. Theoretical principles of the synthesis of new multifunctional reagents for the construction of magnetically and thermosensitive carriers of medicinal substances and biopolymers.
6. Application of acoustic cavitation energy for intensification of technological processes of water purification.
7. Study of processes of heterogeneous oxidation of organic compounds
8. Polymer materials based on petroleum raw materials.
9. Scientific bases of synthesis and research of the latest polymers.
10. Chemical and physical methods of modification of polymers and oligomers.

III. Attestation of postgraduate students

The attestation of applicants for higher education with the degree of Doctor of Philosophy is carried out by a specialized academic council formed for a one-time defense, on the basis of a public defense of scientific achievements in the form of a dissertation.

A mandatory condition for admission to the defense is the successful completion of the graduate student's individual study plan.

Candidates of higher education for the degree of Doctor of Philosophy defend their dissertations, as a rule, in a permanent specialized academic council for the relevant specialty, which functions in the higher educational institution where the graduate student was trained. The academic council of a higher educational institution has the right to submit documents to the National Agency for Quality Assurance of Higher Education for the accreditation of a specialized academic council formed for a one-time defense, or to apply to another higher educational institution where a permanent specialized academic council in the relevant specialty operates .

IV. Characteristics of the system of internal quality assurance of the training of the third-level higher education applicant

The system of internal assurance of the quality of higher education by a higher educational institution consists of the following procedures and measures provided for by the Law of Ukraine "On higher education":

- 1) determination of the principles and procedures for ensuring the quality of higher education;
- 2) monitoring and periodic review of educational programs;
- 3) annual assessment of Ph.D. degree holders, scientific and pedagogical workers of a higher educational institution and regular publication of the results of such assessments on the official website of the higher educational institution, on information stands, etc.;
- 4) provision of advanced training of scientific and pedagogical workers;
- 5) ensuring the availability of the necessary resources for the organization of the educational process, including the independent work of applicants of the third level of higher education, for each educational program;
- 6) ensuring the availability of information systems for effective management of the educational process;
- 7) ensuring publicity of information about educational programs, degrees of education and qualifications;
- 8) provision of an effective system of prevention and detection of academic plagiarism in the scientific works of employees of higher educational institutions and PhD candidates.

Structural and logical scheme of the educational and scientific program of the Doctor of Philosophy in the specialty 102 "Chemistry"

