MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
LVIV POLYTECHNIC NATIONAL UNIVERSITY

«I CONFIRM»
Act. rector
of Lviv Polytechnic National University
_____ /Yurii BOBALO/
«19» 12 2024

EDUCATIONAL-SCIENTIFIC PROGRAMME

"Transport technologies (by type)"

of the third (educational-scientific) level of higher education

by specialty *275 Transport technologies (by type)*

of field of knowledge *27 Transport*

Qualification: Doctor of Philosophy in Transport technologies (by type)

Adopted at the meeting
Academic Council of the University
(protocol № 18
from «17» 12 2024)

Lviv 2024

LETTER OF CONFIRMATION
of educational-scientific programme

Level of higher education	Third (educational-scientific)
Field of knowledge	27 *Transport*
Specialty	275 *Transport technologies (by type)*
Qualification	Doctor of Philosophy in Transport technologies (by type)

APPROVED
Scientific-methodological council of specialty 275 *Transport technologies (by type)*
Protocol № 3/24-25
from « 11 » 11 2024

Head of Scientific-methodological council of specialty 275 *Transport technologies (by type)*
_____ Yurii ROYKO
from « 11 » 11 2024

Director of ESI of Mechanical Engineering and Transport
_____ Oleksii LANETS
from « 12 » 11 2024

RECOMMENDED
By scientific-methodological council of the university
Protocol № 83
from « 21 » 11 2024

Head of Scientific-methodological council of the university
_____ Anatolii ZAHORODNII

CONFIRMED
Vice Rector for Scientific Research
_____ Ivan DEMYDOV
« 12 » 11 2024

Vice Rector for Scientific-Pedagogical Work
_____ Oleh DAVYDCHAK
« 12 » 11 2024

Head of Educational-methodological department of the university
_____ Vasyl TOMIUK
« 12 » 11 2024

Head of Department of Doctoral and Post-graduate studies
_____ Olena MUKAN
« 12 » 11 2024

Developed by working group for ensuring the quality of the educational-scientific program by which training of applicants at the third (educational-scientific) level of higher education is carried out by specialty 275 "Transport technologies (by type)" consisting of:

Head of the working group (guarantor)	
Yurii ROYKO	CSc Tech, associate professor, head of transport technologies department
Members:	
Yevhen FORNALCHYK	DSc Tech, professor, professor of transport technologies department
Marian HITS	senior researcher of automotive research laboratory in Lviv Research Institute of Forensic Expertise of the Ministry of Justice of Ukraine
Ihor VIKOVYCH	DSc Tech, professor, professor of transport technologies department
Mykola ZHUK	CSc Tech, associate professor, associate professor of transport technologies department
Volodymyr KOVALYSHYN	CSc Tech, associate professor, associate professor of transport technologies department
Mykola BOIKIV	CSc Tech, associate professor, associate professor of transport technologies department
Maksym AFONIN	CSc Tech, associate professor, associate professor of transport technologies department
Anna SOTNIKOVA	postgraduate student of transport technologies department

Guarantor
candidate of technical sciences,
associate professor Yurii ROYKO

Approved and brought into force
By order of the Rector of Lviv Polytechnic National University
from «19» грудня 2024 № 760-1-10.

I. EDUCATIONAL COMPONENT OF EDUCATIONAL-SCIENTIFIC PROGRAM

1. Profile of Doctor of Philosophy programme by specialty 275 "Transport technologies (by type)"

1 – General information	
1	2
Full name of HEI and structural subdivision	Lviv Polytechnic National University Department of transport technologies
Level of higher education	Third (educational-scientific) level
Degree of higher education	Doctor of Philosophy
The full title of the qualification in the original language	Doctor of Philosophy in Transport technologies (by type)
The official name of the ESP	Transport technologies (by type)
Type of diploma and scope of educational–scientific programme	Diploma of Doctor of Philosophy, single, 43 ECTS credits of the educational component of the educational-scientific programme, the term of the educational component of the educational-scientific programme is 2 years
Forms of education	Full-time, part-time
Availability of accreditation	Accredited by the National Agency for Quality Assurance of Higher Education (Certificate №2009 from 29.07.2021. Valid until 01.07.2027)
Cycle/level	NFQ of Ukraine – 8 level, FQ-EHEA – third cycle, EQF-LLL – 8 level
Prerequisites	Persons who have obtained a master's degree may apply to obtain the educational-scientific degree of Doctor of Philosophy in the specialty 275 Transport Technologies (by type). The program of professional entrance examinations for persons who have obtained the previous level of higher education in other specialties should include verification of the person's acquisition of competencies and learning outcomes defined by the standard of higher education in the specialty 275 Transport Technologies (by type) for the second (master's) level of higher education.
Language(s) of teaching	Ukrainian
Main terms and their definitions	In the educational-scientific programme, the main terms and their definitions are used according to the Law of Ukraine "About higher education" from 01.07.2014 № 1556-VII with changes and additions, Law of Ukraine "About scientific and scientific-technical activity" from 26.11.2015 № 848-VIII with changes and additions, The Order of preparation of applicants of higher education of the degree of Doctor of Philosophy and Doctor of Sciences in higher educational institutions (scientific institutions), approved by the Resolution of the Cabinet of Ministers from 23.03.2016 № 261, Standard of Higher Education in the specialty 275 Transport Technologies (by type) for the third (educational-scientific) level of higher education, approved by Order of the MES of Ukraine №1468 from 17.10.2024.

Table continuation

1	2
2 – Aim of educational program	
	To deepen theoretical knowledge and practical skills and abilities in the field of *Transport* by specialty *Transport technologies (by type),* to develop philosophical and linguistic competences, form universal skills of a researcher, sufficient for conducting and successfully completing scientific research and further professional and scientific activities
3 – Characteristic of educational program	
Subject area (field of knowledge, specialty)	Field of knowledge 27 *Transport*; specialty 275 *Transport technologies (by type)*
Orientation of the educational-scientific programme	The educational-scientific program is based on normative regulations and the results of modern scientific research on transport technologies, transport systems, systems of passenger and cargo transportation, peculiarities of traffic flow management, traffic safety and directs the applicant to solving current problems and problems in the field of transport.
Description of the subject area	*Object(s) of study and/or activity:* functioning and development of transport systems, creation and improvement of transport technologies. *Learning objectives:* acquiring the ability to produce new ideas, solve complex problems of professional and/or research and innovation activities in the field of transport systems and technologies, mastering the methodology of scientific and pedagogical activities, as well as conducting one`s own scientific research, the results of which have scientific novelty, theoretical and practical significance. *Theoretical content of the subject area:* principles, concepts, theories of functioning of transport systems and technologies. *Methods, techniques and technologies:* analytical, numerical and experimental methods of studying the functioning of transport systems, methods of long-term, short-term and operational management of transport systems, methods of assessing the effectiveness of transport technologies. *Tools and equipment:* specialized computer and software, multimedia tools; modern devices for transportation control, management of transport systems; field samples and models of transport facilities.
The main focus of the educational-scientific programme	The educational-scientific program provides linguistic competences and universal skills of the researcher, as well as in-depth knowledge in the field of transport systems and technologies. ***Key words:*** foreign language, philosophy, methodology, pedagogics, scientific basics, system analysis, transport, transport system, technological processes in transport, traffic, transportation, project management.
Features of the programme	The educational component of the programme is implemented during 4 semesters, with a duration of 43 credits and has disciplines in the corresponding 2 cycles, which provide: language competences, universal skills of the researcher, knowledge in the chosen specialty, disciplines of the student's free choice, including from master's programmes
4 – Feasibility of graduates to employment and further education	
Feasibility to employment	Employment as research and teaching staff in scientific institutions and higher education institutions, as well as highly qualified employees in research, design, development and other institutions and departments of transport and related industries.
Academic rights of graduates	Obtaining a doctoral degree and additional qualifications in the adult education system

Table continuation

1	2
5 – Teaching and evaluation	
Teaching and studying	A combination of lectures, practical classes, consultations, independent work on solving problems, consultations with teachers, preparation of the theoretical part of the dissertation of Doctor of Philosophy.
Evaluation	Exams, final tests, oral presentations, defense of the theoretical part of the PhD dissertation.
6 – List of graduate competencies	
Integral competency (INT)	Ability to generate new ideas, solve complex problems of professional and/or research and innovation activities in the field of transport systems and technologies, apply the methodology of scientific and pedagogical activities, conduct own research, the results of which have scientific novelty, theoretical and practical significance.
General competencies (GC)	GC01. Ability to think abstractly, analyze and synthesize. GC02. Ability to search, process and analyze scientific information from various sources. GC03. Ability to work in an international context. GC04. Ability to solve complex problems in the field of transport technologies on the basis of a systematic scientific outlook and general cultural outlook in compliance with the principles of professional ethics and academic integrity. GC05. Ability to communicate in Ukrainian and foreign languages (according to the list of the Common European Framework of Reference for Languages) in written and oral form.
Special (professional) competencies (SC)	SC 01. Ability to carry out original research, to achieve scientific results that create new knowledge in the field of transport systems and technologies, the results of which can be published in leading scientific journals in transport technologies and related fields. SC 02. Ability to carry out research and teaching activities in higher education. SC 03. Ability to identify, formulate and solve research problems in the field of transport systems and technologies, evaluate and ensure the quality of research. SC 04. Ability to develop and manage research projects in the field of transport systems and technologies. SC 05. Ability to apply appropriate mathematical methods, models, digital technologies to solve complex problems of transport systems and technologies. SC 06. Ability to integrate knowledge from different fields to solve problems in the field of transport systems and technologies, apply a systematic approach and take into account non-technical aspects in solving engineering problems and conducting research. SC 07. In-depth knowledge of basic regulations, reference materials, current standards, specifications, instructions, and other regulatory documents in the field of transport.
7 - Normative content of Doctor of Philosophy training, formulated in terms of learning outcomes	
Learning outcomes (LO)	LO01. To have advanced conceptual and methodological knowledge of transport systems and technologies and related subject areas, as well as research skills sufficient to conduct scientific and applied research at the level of the latest world achievements, obtain new knowledge and/or implement innovations.

Table continuation

1	2
	Freely present and discuss with specialists and non-specialists the results of research, scientific and applied problems of transport systems and technologies in the native and foreign languages, publish research results in leading international scientific journals. LO02. Formulate and test hypotheses; use appropriate evidence to substantiate conclusions, in particular, the results of theoretical analysis, experimental studies (surveys, observations, etc.) and mathematical and/or computer modeling, available literature. Apply modern tools and technologies for searching, processing and analyzing information, including cloud technologies, methods of analyzing large amounts of data. LO03. Develop and research conceptual, mathematical and computer models of processes and systems, effectively use them to obtain new knowledge and/or create innovative products in the field of transport systems and technologies. LO04. Plan and perform experimental and/or theoretical research in the field of transport systems and technologies to solve problems in the field of transport systems and technologies using modern tools, critically analyze the results of their own research and the results of other researchers in the context of the whole range of modern knowledge on the problem under study. LO05. Deeply understand the general principles and methods of technical sciences, as well as the methodology of scientific research, apply them in their own research in the field of transport systems and technologies and in teaching practice. LO06. To develop research and innovation projects in the field of transport systems and technologies, to justify their social, economic, environmental efficiency, to organize their implementation. L07. To carry out scientific and pedagogical activities in higher education institutions, using innovative forms, means and technologies, to carry out scientific, educational, methodological and regulatory support of the educational process, to develop and teach special disciplines. LO08. In-depth knowledge of the laws of formation of cargo and passenger flows, organization of their management and development of methods for organizing transport processes based on the principles of logistics. LO09. Knowledge of modern achievements of innovative technologies in the field of transport, traffic regulation, traffic flow management.
8 - Descriptors of the national qualifications framework	
Knowledge (KN)	Conceptual and methodological knowledge in a field or on the verge of a field of knowledge or professional activity.
Skills (SK)	1. Specialized abilities/skills and methods necessary to solve significant problems in the field of professional activity, science and/or innovation, to expand and reassess existing knowledge and professional practice. 2. Initiation, planning, implementation and adjustment of a consistent process of thorough scientific research in compliance with proper academic integrity. 3. Critical analysis, evaluation and synthesis of new and complex ideas.
Communication (C)	1. Free communication on issues related to the field of scientific and expert knowledge with colleagues, the broader scientific community, and society as a whole. 2. Use of academic Ukrainian and foreign languages in professional activities and research.

Table continuation

1	2
Autonomy and responsibility (AaR)	1. Demonstration of significant credibility, innovation, a high degree of independence, academic and professional integrity, and a consistent commitment to the development of new ideas or processes in advanced contexts of professional and scholarly activity. 2. Ability to continuous self-development and self-improvement.
8 – Resource support for program implementation	
Specific characteristics of personnel support	100% of scientific and pedagogical workers engaged in teaching professionally oriented disciplines by educational-scientific program "Transport technologies (by types)" have relevant scientific degrees and academic titles.
Specific characteristics of material-technical support	Use of modern applied programs: Cardiosens and Neurocom software complexes for the study of psychophysiological properties of drivers; specialized software products Vissim, Visum produced by PTV Vision for researching traffic flow parameters and designing passenger correspondence and public transport routes; MatCad and Statistica for mathematical processing of research results
Specific characteristics of informational–methodological support	Use of the virtual learning environment of the Lviv Polytechnic National University and author's theoretical and scientific-applied developments of the scientific and pedagogical staff of the university and other universities and research institutes.
9 – Academic mobility (Regulated by the Resolution of the CMU №579 «On the approval of the Regulation on the procedure for realizing the right to academic mobility» from August, 12 2015)	
National credit mobility	Based on bilateral agreements between Lviv Polytechnic National University and higher education institutions of Ukraine.
International credit mobility	Based on bilateral agreements between Lviv Polytechnic National University and higher education institutions of foreign partner countries.
Education of foreign applicants of higher education	Possible after studying Ukrainian language course.

2. Distribution of content of educational component of educational-scientific program by component groups and training cycles

№	Training cycle	The scope of the educational load of the student of higher education (credits / %)		
		Compulsory educational components	Selective educational components	Total for the entire period of study
1.	Cycle of disciplines that form general scientific competencies and universal skills of researcher	21/49	3/7	30/56
2.	Cycle of disciplines that form professional competencies	10/23	6/14	27/37
3.	Disciplines of free choice of postgraduate 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-scientific programme

Code e/c	Name of educational component (EC)	Number of credits	Form of final control
1	2	3	4
Compulsory components of educational component			
Cycle of disciplines that form general scientific competencies and universal skills of researcher			
CC1.1.	Philosophy and methodology of science	3	exam
CC1.2.	Foreign language for academic purposes, part 1	4	final test
CC1.3.	Foreign language for academic purposes, part 2	4	exam
CC1.4.	Professional pedagogics	3	final test
CC1.5.	Academic entrepreneurship	4	final test
CC1.6.	Pedagogical practice	3	final test
Totally per cycle:		**21**	
Cycle of disciplines that form professional competencies			
CC2.1.*	System analysis in transport	4	exam
CC2.2.*	Research seminar in the field of transport	3	final test
CC2.3.	Modeling in transport systems	3	final test
Totally per cycle:		**10**	
Totally per CC		**31**	
Selective components of educational component			
Cycle of disciplines that form general scientific competencies and universal skills of researcher			
SB1.1	Business Foreign Language	3	final test
SB1.2	Psychology of creativity and invention	3	final test
SB1.3	Management of research projects	3	final test
SB1.4	Technology of registration of grant applications and patent rights	3	final test
SB1.5	Rhetoric	3	final test
SB1.6	Modern inventory in research activities	3	final test
SB1.7	Open scientific practices	3	final test

Table continuation

1	2	3	4
SB1.8	Academic integrity and quality of education	3	final test
SB1.9	Methodology of preparation of scientific publications	3	final test
SB1.10	Quality of higher education (formation of internal quality assurance systems)	3	final test
Totally per cycle:		**3**	
*Cycle of disciplines that form professional competencies***			
SB2.1	Scientific bases of transport processes and systems	3	exam
SB2.2	Methods of multidimensional analysis	3	exam
SB2.3	Intelligent transport systems	3	exam
SB2.4	Scientific research methods	3	exam
SB2.5	Ergonomics in transport systems	3	exam
SB2.6	Ecological transport	3	exam
SB2.7	Systems of traffic organization and management	3	exam
SB2.8	Technological processes of transportation	3	exam
Totally per cycle:		**6**	
Disciplines of free choice of postgraduate student***			
SB3.1	Discipline of free choice of postgraduate student	3	final test
Totally per cycle:		**3**	
Totally per selective components		**15**	
Totally per educational component		**43**	

Note:

* - list of disciplines that form professional competencies is proposed mutual for ESP of related fields and specialties;

** - list of disciplines that form professional competencies should contain ten disciplines, from which postgraduate student chooses two;

*** - postgraduate student can select disciplines which are taught in Lviv Polytechnic National University or other domestic (foreign) HEI (scientific establishments) on all levels.

4. Matrix of correspondence of programme competencies to educational components

	CC 1.1	CC 1.2	CC 1.3	CC 1.4	CC 1.5	CC 1.6	CC 2.1	CC 2.2	CC 2.3	SB 1.1	SB 1.2	SB 1.3	SB 1.4	SB 1.5	SB 1.6	SB 1.7	SB 1.8	SB 1.9	SB 1.10	SB 2.1	SB 2.2	SB 2.3	SB 2.4	SB 2.5	SB 2.6	SB 2.7	SB 2.8	SB 3.1 *
INT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
GC01	+					+	+				+				+						+							+
GC02					+	+	+	+			+		+			+				+			+					+
GC03		+	+							+		+		+				+										+
GC04	+			+			+								+	+	+		+					+				+
GC05		+	+							+				+														+
SC01								+	+		+				+	+	+	+		+	+		+		+	+	+	+
SC02				+		+													+									+
SC03								+				+			+	+			+	+			+			+	+	+
SC04					+							+	+					+				+			+			+
SC05									+											+	+		+					+
SC06					+		+				+				+					+		+		+		+	+	+
SC07								+					+													+		+

Note:

* - may ensure the acquisition of any of the following program competencies

5. Matrix of provision of programme results of the study to corresponding components of educational-scientific programme

	CC 1.1	CC 1.2	CC 1.3	CC 1.4	CC 1.5	CC 1.6	CC 2.1	CC 2.2	CC 2.3	SB 1.1	SB 1.2	SB 1.3	SB 1.4	SB 1.5	SB 1.6	SB 1.7	SB 1.8	SB 1.9	SB 1.10	SB 2.1	SB 2.2	SB 2.3	SB 2.4	SB 2.5	SB 2.6	SB 2.7	SB 2.8	SB 3.1
LO01		+	+		+		+	+		+		+	+	+		+	+	+			+		+		+			+
LO02	+						+	+	+		+				+	+		+			+		+			+	+	+
LO03					+		+						+			+				+			+					+
LO04	+							+							+		+	+		+			+					+
LO05				+		+		+							+			+		+			+					+
LO06					+						+	+	+							+		+	+	+	+			+
LO07				+		+								+			+		+									+
LO08							+		+											+					+		+	+
LO09							+		+						+					+		+			+	+		+

Note:

* - may ensure the acquisition of any of the following program results of the study

6. Matrix of compliance of the competencies / learning outcomes defined by the Standard with the NQF descriptors

Classification of competencies (learning outcomes) according to the NQF	**Knowledge** **Kn1** Conceptual and methodological knowledge in a field or on the verge of a field of knowledge or professional activity	**Skills** **Sk1.** Specialized abilities/skills and methods necessary to solve significant problems in the field of professional activity, science and/or innovation, to expand and reassess existing knowledge and professional practice. **Sk2.** Initiation, planning, implementation and adjustment of a consistent process of thorough scientific research in compliance with proper academic integrity. **Sk3**. Critical analysis, evaluation and synthesis of new and complex ideas.	**Communication** **C1**. Free communication on issues related to the field of scientific and expert knowledge with colleagues, the broader scientific community, and society as a whole. **C2**. Use of academic Ukrainian and foreign languages in professional activities and research.	**Autonomy and Responsibility** **AaR1**. Demonstration of significant credibility, innovation, a high degree of independence, academic and professional integrity, and a consistent commitment to the development of new ideas or processes in advanced contexts of professional and scholarly activity. **AaR2**. Ability to continuous self-development and self-improvement.
General competencies				
GC 01		**Sk1**		**AaR2**
GC 02	**Kn1**			**AaR2**
GC 03	**Kn1**	**Sk2**	**C1**	**AaR2**
GC 04	**Kn1**	**Sk2**	**C1**	**AaR1**
GC 05			**C2**	
Special (professional) competencies				
SC 01	**Kn1**	**Sk3**		**AaR2**
SC 02		**Sk1**	**C2**	**AaR1**
SC 03	**Kn1**	**Sk3**	**C1**	**AaR1**
SC 04		**Sk2**	**C1**	**AaR1**
SC 05	**Kn1**	**Sk1**		
SC 06			**C2**	**AaR1**
SC 07	**Kn1**		**C1**	

7. Matrix of compliance with the learning outcomes and competencies defined by the Standard

Learning outcomes	Competencies											
	Integral competency: Ability to generate new ideas, solve complex problems of professional and/or research and innovation activities in the field of transport systems and technologies, apply the methodology of scientific and pedagogical activities, conduct own research, the results of which have scientific novelty, theoretical and practical significance.											
	General competencies					Special (professional, subject) competencies						
	GC01	GC02	GC03	GC04	GC05	SC01	SC02	SC03	SC04	SC05	SC06	SC07
LO 01				+	+	+					+	
LO 02	+	+				+		+				+
LO 03						+				+		
LO 04	+	+				+						
LO 05	+		+			+		+				
LO 06		+							+			
LO 07							+					
LO 08										+	+	+
LO 09												+

II. SCIENTIFIC COMPONENT OF EDUCATIONAL-SCIENTIFIC PROGRAM

Scientific component of educational-scientific program provides the conduction by postgraduate student his own scientific research under guidance of one or two scientific advisors and the preparation of the results in the form of a dissertation.

The dissertation for obtaining the scientific degree of Doctor of Philosophy is an independent study of a postgraduate student, which offers a solution to an actual scientific and applied task in the specialty *275 Transport technologies (by type)*, the results of which are characterized by scientific novelty and practical value and are published in relevant publications.

Scientific component of educational-scientific program is issued in the form of an individual plan of the postgraduate student's scientific work and is an integral part of the postgraduate school curriculum.

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

According to the Regulations on academic integrity at Lviv Polytechnic National University, any scientist, including the applicant, is responsible for academic dishonesty, which can manifest itself in the following forms:

- academic plagiarism;
- academic fraud;
- execution to order and (or) sale of academic texts of dissertation studies;
- academic falsification and fabrication;
- publication of fictional research results, any data about the educational process;
- attribution of results of collective activity to one or specific persons without coordination with other members of author`s collective or inclusion in the list of authors of scientific or educational-methodological work of persons who did not participate in the creation of the product;
- academic deception;
- academic bribery;
- conflict of interest;
- private interest.

Topics of scientific research by specialty

275 Transport technologies (by type)

1. Improvement of means, technologies of goods, passenger and luggage transportation, and operational management methods of transhipping processes at nodes of the transport network.

2. Research and development the complex of technical means for the development and effective use of transport systems elements.

3. Determination of the regularities of mutual impact of transport systems and external environment.

4. Research on the regularities of formation of the demand on transport services at passenger and goods transportation. Development of decision-making models on deliveries of various freights in regional, interregional and international connections by subjects of transport markets.

5. Identification and justification of factors of traffic systems effectiveness, development of theory and methods of management of transport systems development.

6. Regularities of cargo flows formation, organization of their control and development of methods of transport process organization based on the principles of logistics, formation of appropriate systems of freight forwarding service.

7. Regularities of passenger flows formation, development of passenger systems of urban, rural areas and regions.

8. Justification of technological processes of passenger and cargo transportation, their organization and management in integrated systems and systems of particular types of transport: aviation, road, water, rail.

9. Development of rational systems and justification of means of complex mechanization and automation of loading and unloading operations at coincidence points of different modes of transport.

10. Regularities of traffic flow formation and development of their management's traffic organization systems and technology.

11. Transport safety problems. Regularities of the impact of human factor on transport processes.

12. Research on the effectiveness of transport processes, logistics management, interaction of different types of transport and optimization of cross-border tourist routes.

III. Certification of postgraduate students

Forms of certification of higher education applicants	Certification of applicants is carried out in the form of a public defense of the dissertation.
Requirements for qualifying paper for the degree of Doctor of Philosophy	The dissertation for the degree of Doctor of Philosophy is an independent detailed study that offers a solution to a complex problem in the field of transport systems and technologies, the results of which have scientific novelty, theoretical and practical significance. The dissertation should not contain academic plagiarism, falsification, or fabrication. Dissertations of persons obtaining the degree of Doctor of Philosophy, reviews and comments on them are published on the official website of the relevant higher education institution or research institution.

Structural–logical scheme of educational-scientific programme for preparation of Doctors of Philosophy in specialty 275 "Transport technologies (by type)"