MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL UNIVERSITY
“LVIV POLYTECHNIC”

APPROVED
Rector
of the National University
“Lviv Polytechnic National University”

_____Yu. Ya. Bobalo

“____”_____2022
Considered and approved
at the meeting of the Academic Council
of the National University
"Lviv Polytechnic National University
Minutes of 2022, no.

EDUCATIONAL AND SCIENTIFIC PROGRAM

LEVEL OF HIGHER EDUCATION	third (educational and scientific)
HIGHER EDUCATION DEGREE	PhD
AREA OF EXPERTISE	18 Production and technology
SPECIALTY	186 Publishing and printing

Considered and approved
at the meeting of the Academic Council
of the National University
“Lviv Polytechnic National University”
Minutes of 2022, №

Lviv 2022

LETTER OF APPROVAL
of the educational and scientific program

Level of higher education	third (educational and scientific)
Area of expertise	18 *Production and technology*
Specialty	186 *Publishing and printing*
Qualifications	Doctor of Philosophy in Publishing and Printing

APPROVED
Scientific and methodological commission of the specialty 186 Publishing and printing
Protocol № ____
dated "___" _____ 2022

Head of the specialty's ECM
186 Publishing and printing
_____Tkachenko R.O.

"___" _____ 2022

Director of IKNI
_____ Medykovskyi M.O.
"___" _____ 2022

AGREED
Head of the educational and methodological department
_____ Sviridov V.M.
"___" _____ 2022

Vice-rector for scientific work
_____ Demydov I.V.
"___" _____ 2022

Vice-rector for scientific and pedagogical work
_____Davydchak O.R.
"___" _____ 2022

RECOMMENDED
Scientific and methodological council of the university
Protocol № ____
dated "___" _____ 2022
Chairman of the NMC
_____Zagorodnyi A.H.

PREFACE

Developed on the basis of the standard of higher education of Ukraine in the specialty 186 "Publishing and Printing" of the field of knowledge 18 "Production and Technology" for the third (educational and scientific) level of higher education, approved by the Order of the Ministry of Education and Science of Ukraine №641 of 20.07.2022.

Developed by the working group of the scientific and methodological commission of the specialty 186 "Publishing and Printing" consisting of:

Havrysh B.M.	– Guarantor of ONP, PhD in Engineering, Associate Professor, Associate Professor of the Department of Information Technology in Publishing
Lotoshynska N.D.	– PhD in Engineering, Associate Professor, Associate Professor of the Department of Information Technologies in Publishing
Riznyk O.Ya.	– PhD in Engineering, Associate Professor, Associate Professor of the Department of Information Technologies in Publishing
Tkachenko R.O.	– Doctor of Technical Sciences, Professor, Professor of the Department of Information Technologies in Publishing
Paroviak I.P.	– Director of the printing house of Lviv Polytechnic Publishing House
Lozovytska I.I.	– student of the group VPKT-21 of the Department of Information Technologies of Publishing

The guarantor of the OPP, PhD in Engineering, Associate Professor,
Associate Professor of the Department of ITVS _____Havrysh B.M.

The draft educational and scientific program was discussed and approved at the meeting of the Academic Council of the Institute of Computer Science and Information Technologies

Protocol №_____ dated "___" _____ 2022

Chairman of the Academic Council of ICNI _____ Medykovskyi M.O.
(signature) (surname, initials)

Approved and entered into force

By the order of the Rector of Lviv Polytechnic National University

dated "___" _____ 2022 № ___.

Qualification: Doctor of Philosophy in Publishing and Printing

I. Educational component of the educational and scientific program
Profile of the Doctor of Philosophy program in Knowledge area 18 *Production and Technology* in specialty 186 *Publishing and printing*

1 – General information	
Full name of the higher education institution and structural unit	Lviv Polytechnic National University
Level of higher education	Third (educational and scientific) level
Degree of higher education	D. in Philosophy
Field of expertise	18 Production and technology
Specialization	186 Publishing and printing
Forms of education	Full-time (day, evening), part-time
Educational qualifications	Doctor of Philosophy in Publishing and Printing
Qualification in the diploma	Degree of higher education – Doctor of Philosophy Field of expertise – 18 Production and technology Specialization – 186 Publishing and printing
Cycle/level	NQF of Ukraine – level 8. FQ-EHEA – third cycle. EQF-LLL – level 8
Language(s) of teaching	Ukrainian language
Objective of the educational program	To deepen theoretical knowledge and practical skills in solving complex problems in the field of publishing and printing, conducting scientific, research and innovation activities, and implementing the results obtained.
2 – Characteristics of the educational program	
Subject area (field of knowledge, specialty)	Field of knowledge 18 "Production and Technology". Specialization 186 "Publishing and printing"
Description of the subject area	*Objects of study and activity*: products and technologies publishing and printing, their research and improvement, creation, manufacturing, distribution, operation and restoration. *Learning objectives*: to acquire the ability to solve complex problems of professional and/or research and innovation activities in the field of publishing and printing, which involves a deep rethinking of existing and creation of new holistic knowledge and/or professional practice. *Theoretical content of the subject area*: concepts, concepts, principles of: publishing processing of various types of information; development and implementation of technological processes and their components; design and organization of production; creation and improvement of products and technologies of publishing and printing. *Methods, tools and technologies*: methods of design, manufacturing, testing, control of products and technological processes of publishing and printing; methods of calculation,

	modeling, design and implementation of technological processes, methods of data analysis. *Tools and equipment*: hardware and software systems, equipment for control, design and modeling of technological processes and products of publishing and printing; means of technological, information, instrumental, metrological, diagnostic, material and organizational support of production.
Academic rights of graduates	Integral competence (IC) Obtaining a doctoral degree and additional qualifications in the adult education system.
Employment of graduates	Professional activity of scientific and scientific-pedagogical workers in scientific institutions and higher education institutions, research, design and development institutions and divisions of enterprises.
3 – Requirements for the level of education of persons who can start studying in educational programs of the relevant specialty and their learning outcomes	
Educational requirements	To obtain the degree of Doctor of Philosophy in the educational programs of the specialty 186 Publishing and Printing, persons who have obtained a master's degree may apply.
Checking the acquisition of competencies and learning outcomes	The program of professional entrance examinations for persons who have received 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 186 Publishing and Printing for the second (master's) level of higher education.
Further education	Advanced training at research institutes of the National Academy of Sciences of Ukraine, leading universities and research centers of IT companies.
4 – ECTS credits required for obtaining a higher education degree Doctor of Philosophy	
Normative period of preparation	The educational and research program consists of educational and scientific components. The standard term for obtaining a PhD in a postgraduate program is four years.
Scope of the educational component	The volume of the educational component of the Doctor of Philosophy program is 30-60 ECTS credits.
5 – List of graduate competencies	
Integral competence (IC)	IC. The ability to generate new ideas, solve complex problems of professional and/or research and innovation activities in the field of publishing and printing, apply the methodology of scientific and pedagogical activities, and conduct their own research, the results of which have scientific novelty, theoretical and practical significance.
General competencies (GC)	GC 1. Ability to work in an international context . GC 2. Ability to develop and manage projects. GC 3 Ability to solve complex problems in the field of publishing and printing based on a systematic scientific outlook and general cultural outlook in compliance with the principles of professional ethics and academic integrity.

Special (professional, subject) competencies (SC)	SC 1. Ability to plan and carry out original research, achieve scientific results that create new knowledge in the field of publishing and printing and related interdisciplinary areas. SC 2. Ability to integrate knowledge from different fields, apply a systematic approach and take into account non-technical aspects in solving complex problems of publishing and printing during research. SC 3 Ability to identify, formulate and solve research problems in the field of publishing and printing; evaluate and ensure the quality of research. SC 4. Ability to apply modern digital technologies, databases and other electronic resources, specialized software, appropriate mathematical, scientific and technical methods in research and educational activities. SC 5. Ability to initiate, develop and implement research and innovation projects in the field of publishing and printing, plan and organize the work of research teams. SC 6. Ability to carry out and organize research and pedagogical activities in higher and professional higher education institutions.
Professional competencies of the professional direction (PCC)	***Block 0.1.*** PCC 1.1. Understand the logic of conducting research and drafting scientific projects, navigate the issues of scientific research and choose appropriate methodological tools for their implementation. Understand the nature of science, scientific problems, methodological features of scientific knowledge. FCC 1.2. Developing self-assessment and independent learning abilities that will allow students to continue their education in an academic and professional environment both during their studies at the university and after receiving a higher education diploma. FCC 1.3. Professionally-oriented communicative language competencies (linguistic, sociolinguistic and pragmatic) to ensure their communication in a familiar academic and professional environment. PCC 1.4. Ability to produce innovative scientific ideas, master the methodology of scientific and pedagogical activities, solve complex problems in the process of innovation, research and professional activities, conduct original scientific research in the professional field at the international and national levels. PCC 1.5. Systematic knowledge in the field of entrepreneurship, innovation marketing and technology transfer Ability to generate new ideas, create innovations and launch startups. Ability to socialize and work in a team. Ability to create public benefit and combine it with personal benefit. Organize the implementation of key management functions, taking into account the peculiarities of innovative business, and build the process of commercialization of innovations. PCC 1.6. Acquiring universal skills of a researcher, in particular, organizing and conducting training sessions, using modern

	information technologies (working with VNS, Microsoft Times, Zoom, etc.).
	Block 02 PCC 2.1. Ability to effectively apply methods of analysis, mathematical modeling, optimization. Perform physical and mathematical experiments in the course of scientific research. PCC 2.2. Ability and skill to develop and research methods of analysis, synthesis, optimization and prediction of signals and images. PCC 2.3. Ability to form new competitive ideas in the field of artificial intelligence systems.
6 – Normative content of training of higher education applicants, formulated in terms of learning outcomes	
Learning outcomes (LOs)	LOs 1. Possess advanced conceptual and methodological knowledge in the field of publishing and printing and on the border of 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. LOs 2. To know the existing, identify new, highlight promising scientific and practical problems of publishing and printing, identify and take into account their interdisciplinary and global contexts, determine methods and means of solving these problems, analyze and evaluate the state and prospects of technology development in the field of publishing and printing. LOs 3. Formulate and test hypotheses; use appropriate evidence, in particular, the results of theoretical analysis, experimental studies and mathematical and/or computer modeling, available scientific and technical information to substantiate conclusions. LOs 4. To plan and carry out experimental and/or theoretical research in publishing and printing and related interdisciplinary areas using modern tools and technologies for searching, processing and analyzing information and in compliance with the norms of academic and professional ethics, to critically analyze the results of their own research and the results of other researchers in the context of the whole range of modern knowledge about the problem under study, the state and prospects of technology development in the field of publishing and printing. LOs 5. To freely present and discuss with specialists and non-specialists the results of research, scientific and applied problems of publishing and printing in the state and foreign languages, to publish the results of research in scientific publications in leading international scientific journals. LOs 6. To develop, research, improve 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 publishing and printing and other areas.

	LOs 7. Develop and implement scientific and/or innovative engineering projects that allow to rethink existing and create new holistic knowledge and/or professional practice and solve significant scientific and technological problems of publishing and printing, taking into account social, economic, environmental and legal aspects. LOs 8. To organize and carry out the educational process in the field of publishing and printing, its scientific, educational, methodological and regulatory support, to develop and teach special disciplines in higher education institutions. ***Block 0.1.*** LOs 1.1. Acquisition of universal research skills, including oral and written presentation of research results in Ukrainian. LOs 1.2. Acquisition of sustainable components of a creative style of thinking, namely: the ability to analyze problems, establish systemic connections, identify contradictions, find solutions at the level of ideal ones, and predict possible options for such solutions. LOs 1.3. Identification of the peculiarities of the use of cognitive processes in creative activity. LOs 1.4.Management of scientific projects and/or preparation of scientific proposals for research funding, registration of intellectual property rights, application of modern information technologies. LOs 1.5.Acquiring language competencies sufficient to present and discuss the results of their work in a foreign language in oral and written form, as well as to fully understand foreign language scientific texts in the relevant specialty. LOs 1.6.Application of modern information technologies (presentation of scientific results). LOs 1.7. Mastering general scientific (philosophical) competencies aimed at forming a systematic scientific outlook, professional ethics and general cultural outlook. LOs 1.8. Application of modern information technologies in scientific activities (work with NMBD, automatic generation of references to literary sources). LOs 1.9. Be able to use modern experimental and mathematical methods, information technology and specialized software for research and development in the field of publishing and printing. LOs 1.10. Acquiring universal skills of a researcher, in particular, organizing and conducting training sessions, using modern information technologies (working with VNS, Microsoft Times, Zoom, etc.). ***Block 02*** LOs 2.1. Ability and skills in the selection and application of modern tools for data mining in the field of printing, data selection and application of results for decision support LOs 2.2. Acquiring skills of analytical research based on artificial intelligence models represented by poorly structured

	data methods of protecting information on printed and material media. LOs 2.3. Ability and skills to formulate and test hypotheses of educational and cognitive nature; creation, study and use of objects; use of information and communication technologies (ICT) for problem areas of publishing and printing houses LOs 2.4. Understanding of the general global trends in the development of computational intelligence methods for analyzing large volumes of machine learning data, architectures of modern information and analytical systems. LOs 2.5. Understanding of general global trends in the development of computational intelligence methods for big data analytics, machine learning, architectures of modern information and analytical systems. LOs 2.6. Ability to develop image processing and computer vision systems, develop and apply neural networks of various types and architectures to solve problems of prediction, classification and pattern recognition. LOs 2.7. Ability to effectively use machine learning technologies in the development of decision-making systems, intelligent information systems for forecasting tasks of electronic publishing. LOs 2.8. Acquiring knowledge of analytical research based on artificial intelligence models represented by poorly structured data. LOs 2.9. Gaining skills in selecting and using graphic object recognition systems. LOs 2.10. Acquisition of universal research skills, analysis, synthesis and optimization based on artificial intelligence models represented by unstructured data.
7 – Resource support for program implementation	
Specific characteristics of staffing	100% of the faculty involved in teaching professionally oriented disciplines have academic degrees in their specialty.
Specific characteristics of logistics support	Use of modern software and hardware from leading IT companies and design studios/
Specific characteristics of information and methodological support	Use of the virtual learning environment of Lviv Polytechnic National University and the author's developments of the faculty.
8 – Main components of the educational program	
List of educational components (disciplines, practices, coursework, and qualification papers)	The matrix of correspondence of program competencies to academic disciplines and the structure of the curriculum are provided in the appendices.
10 – Academic mobility	
National credit mobility	Based on bilateral agreements between Lviv Polytechnic National University and technical universities in Ukraine.

International credit mobility	Within the framework of the EU Erasmus+ program, on the basis of bilateral agreements between Lviv Polytechnic National University and educational institutions of partner countries.
Training of foreign applicants for higher education	It's possible.

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

№ p/n	Preparation cycle	The volume of the postgraduate student's academic load (credits, %)		
		Mandatory components of the educational component	Selective components of the educational component	Total for the term of study
1.	A cycle of disciplines that form general scientific competencies and universal skills of a researcher	21/49	3/7	24/56
2.	The cycle of disciplines that form professional competencies	10/23	6/14	16/37
3.	The cycle of disciplines 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	Educational components of the program	Number of credits	Form of final control.
1	2	3	4
1. Mandatory educational components of the program			
1.1 The cycle of disciplines that form general scientific competencies and universal skills of a researcher			
MC 1.1.	Philosophy and methodology of science	3	examination
MC 1.2.	Foreign language for academic purposes, part 1	4	setoff
MC 1.3.	Foreign language for academic purposes, part 2	4	examination
MC 1.4.	Professional pedagogy	3	setoff
MC 1.5.	Academic entrepreneurship	4	setoff
MC 1.6.	Pedagogical practice	3	setoff
Total per cycle		**21**	
1.2. The cycle of disciplines that form professional competencies *			
MC 2.1.	Methods for analyzing and optimizing complex systems	3	examination
MC 2.2.	Information technologies for digital signal and image processing	3	examination
MC 2.3.	Artificial intelligence systems in publishing and printing	4	examination
Total per cycle		**10**	
Total		**31**	
2. Selective components of the educational component **			
2.1. The cycle of disciplines that form general scientific competencies and universal skills of a researcher			
SC1.1.	Business foreign language	3	setoff
SC 1.2.	Psychology of creativity and invention	3	setoff
SC 1.3.	Technology for processing grant applications and patent rights	3	setoff
SC 1.4.	Rhetoric	3	setoff

SC 1.5.	Modern inventory in research and development	3	setoff
SC 1.6.	Open scientific practices	3	setoff
SC 1.7.	Academic integrity and quality of education	3	setoff
SC 1.8.	Methodology for preparing scientific publications	3	setoff
SC 1.9.		3	setoff
Total per cycle		**3**	
2.2. The cycle of disciplines that form professional competencies			
SC 2.1.	Neural networks and neuro-fuzzy machine learning tools	3	examination
SC 2.2.	Methods of protecting information on printed and tangible media	3	examination
SC 2.3.	Information modeling of problem areas of publishing houses and printing houses	3	examination
SC 2.4.	Optimization methods and algorithms in publishing and printing	3	examination
SC 2.5.	Computational intelligence methods for big data analytics	3	examination
SC 2.6.	Analysis, recognition and classification of images using artificial intelligence methods	3	examination
SC 2.7.	Machine learning in e-publishing forecasting tasks	3	examination
SC 2.8.	Analyzing big data	3	examination
SC 2.9.	Methods for recognizing graphic objects	3	examination
SC 2.10.	Ensemble methods of machine learning	3	examination
Total per cycle		**6**	
Total		**9**	
3. Disciplines of free choice of the graduate student ***			
SC 3.1.	Discipline of free choice of a graduate student	3	setoff
Total per cycle		**3**	
TOTAL		**43**	

Note:

* – disciplines that form professional competencies (MC2.1. and MC2.2.) are offered in common for EPPs in related fields and specialties, discipline MC2.3. is offered within one specialty;

** – the list of elective disciplines that form professional competencies must include at least eight disciplines, of which the graduate student chooses two;

*** – a postgraduate student can choose disciplines taught at Lviv Polytechnic National University or other domestic (foreign) higher education institutions (research institutions) at all levels.

4. Forms of certification of higher education applicants

Forms of certification of higher education applicants	Certification of applicants for the degree of Doctor of of Philosophy is carried out in the form of a public defense of the dissertation.
Requirements for a dissertation for the degree of Doctor of Philosophy	A dissertation for the degree of Doctor of Philosophy is an independent detailed research that offers a solution to a complex problem in the field of publishing and printing or on its border with other specialties, the results of which have scientific novelty, theoretical and practical significance. The dissertation should not contain academic plagiarism, falsification, or fabrication. The dissertation and its abstract must be posted on the website of the higher education institution (research institution).

5. Matrix of correspondence between program competencies and educational components

	MC 1.1.	MC 1.2.	MC 1.3.	MC 1.4.	MC 1.5.	MC 1.6.	MC 2.1.	MC 2.2.	MC 2.3.	SC 1.1.	SC 1.2.	SC 1.3.	SC 1.4.	SC 1.5.	SC 1.6.	SC 1.7.	SC 1.8.	SC 1.9.	SC 1.10.	SC 2.1.	SC 2.2.	SC 2.3.	SC 2.4.	SC 2.5.	SC 2.6.	SC 2.7.	SC 2.8.	SC 2.9.	SC 2.10.	SC 3.1.
IC								•			•		•			•		•		•									
GC 1	•	•	•							•	•	•	•	•	•	•	•	•	•				•						
GC 2		•	•				•			•	•	•	•	•	•	•	•	•	•			•							
GC 3				•		•				•	•	•	•	•	•	•	•	•	•		•	•	•		•	•	•		
SC 1					•		•	•						•			•			•	•			•			•	•	•	
SC 2				•			•		•	•			•								•	•	•		•	•		•	•	
SC 3							•	•					•		•	•					•	•	•		•			•		•
SC 4							•		•									•		•			•	•	•	•	•	•		•
SC 5									•		•	•		•						•	•	•		•	•	•	•		•	
SC 6					•	•		•							•	•						•		•			•		•	
PCC 1.1	•				•																									
PCC 1.2	•	•																												
PCC 1.3		•	•					•											•			•			•		•	•		
PCC 1.4				•			•							•											•					
PCC 1.5					•													•							•					
PCC 1.6					•	•						•																•		•
PCC 2.1						•	•									•				•					•	•				•
PCC 2.2								•																						•
PCC 2.3									•													•				•				•

Symbols and notation: MCi – compulsory discipline, SCi – selective discipline, i – discipline number in the list of components of the educational component, IC – integral competence, GCj – general competence, SCj – professional (special) competence, PCCj – Professional competencies of the professional direction, j – competence number in the list of competences of the educational component.

6. Matrix of providing program learning outcomes with relevant components of the educational component

	MC 1.1.	MC 1.2.	MC 1.3.	MC 1.4.	MC 1.5.	MC 1.6.	MC 2.1.	MC 2.2.	MC 2.3.	SC 1.1.	SC 1.2.	SC 1.3.	SC 1.4.	SC 1.5.	SC 1.6.	SC 1.7.	SC 1.8.	SC 1.9.	SC 1.10.	SC 2.1.	SC 2.2.	SC 2.3.	SC 2.4.	SC 2.5.	SC 2.6.	SC 2.7.	SC 2.8.	SC 2.9.	SC 2.10.	SC 3.1.
LR 1								•	•	•										•	•	•		•					•
LR 2				•	•			•	•		•						•	•	•		•	•	•				•	•	•	•
LR 3	•				•			•		•	•			•			•	•	•	•	•	•	•				•	•	•	•
LR 4	•				•	•	•	•	•	•	•			•					•	•			•	•			•	•		•
LR 5	•			•	•	•	•						•	•	•						•	•							•	•
LR 6	•				•	•	•	•		•	•			•						•								•		•
LR 7	•				•	•	•	•		•	•			•			•	•	•	•	•	•	•				•	•	•	•
LR 8	•				•	•	•	•	•	•	•			•					•	•			•	•			•	•		•
LR 1.1	•			•	•	•	•						•	•	•															•
LR 1.2	•				•			•		•	•			•					•	•			•	•	•		•	•		•
LR 1.3		•	•			•	•					•				•								•		•				
LR 1.4		•	•			•	•					•				•										•				
LR 1.5		•	•			•	•					•				•										•				
LR 1.6				•			•						•		•							•			•					
LR 1.7				•			•						•									•			•					
LR 1.8				•			•						•									•								
LR 1.9	•			•	•		•					•				•	•					•								
LR1.10				•		•																								
LR 2.1																						•	•			•				•
LR 2.2									•											•				•	•				•	
LR 2.3					•																	•					•			•
LR 2.4							•	•	•				•			•						•	•							
LR 2.5							•																•			•	•			•
LR 2.6							•	•	•											•				•		•			•	
LR 2.7				•										•								•		•						•
LR 2.8									•																•		•		•	
LR 2.9							•	•							•			•										•	•	•
LR2.10							•				•										•		•	•			•	•		•

Symbols and notation: MC – Mandatory discipline, SC – selective discipline, i – number of the discipline in the list of components of the educational component, LRj – program results of learning, j – number of the program result of the list of competencies of the educational component.

I. Scientific component of the educational and scientific program

The scientific component of the educational and research program involves a postgraduate student conducting his or her own research under the guidance of one or two supervisors and presenting its results in the form of a dissertation.

The dissertation for the degree of Doctor of Philosophy is an independent detailed study that offers a solution to an actual scientific problem in the specialty 186 "Publishing and Printing", the results of which constitute an original contribution to the amount of knowledge in the specialty 186 "Publishing and Printing" and are published in relevant publications.

The scientific component of the educational and scientific program is drawn up in the form of an individual plan of scientific work of a graduate student and is an integral part of the curriculum of the graduate school.

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

Research topics and specialties 186 "Publishing and printing"

1. Creation and application of information technologies in printing and for automated information processing and management.
2. Improving the quality of printing of printed publications on the basis of the latest technologies for converting electronic, multimedia, interactive information products.
3. Information technologies in publishing houses for the analysis and synthesis of structural, informational and functional models of automated objects and processes.
4. Models and methods for automating the performance of functions and tasks of production and organizational management in publishing houses in conventional and multilevel structures based on the creation and use of new information technologies.
5. Information security technologies for the development and implementation of databases and data warehouses, knowledge bases and computer decision support systems in automated printing systems.
6. Information technologies for publishing systems, analysis, development of architecture and methods for building multi-level computer systems with distributed parameters, including commercial applications.
7. Information technologies for efficient software development for printing enterprises with distributed data processing.
8. Modeling of subject areas of information systems based on artificial intelligence.
9. Development of information retrieval and expert information processing systems for the creation of publications, as well as knowledge of oriented decision support systems under conditions of risk and uncertainty.
10. Development of artificial intelligence systems for the construction and implementation of: automated systems for technical diagnostics of publishing houses and computer systems of e-business.
11. Information technologies for the development of models, methods and tools for automation of information retrieval and telecommunication systems, networks and information support tools for libraries, museums and archives (electronic catalogs, automated workstations, computer bibliography, automated document import systems, etc.)
12. Methods for recognizing emotions in online video streams.
13. Methods of distributed tracking of objects in conditions of weak separation.
14. Methods of deep analysis of unstructured data based on machine learning.
15. Methods of text synthesis based on models of text processing processes
16. Methods of semantic and syntactic compression of structured text.
17. Methods of adaptive evaluation of cluster topologies in text processing.

Structural and logical scheme of the educational and scientific program of the third (educational and scientific) level of education