MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
RIVNE STATE UNIVERSITY OF THE HUMANITIES

EDUCATIONAL AND PROFESSIONAL PROGRAM

PROFESSIONAL EDUCATION (COMPUTER TECHNOLOGIES)

THE LEVEL OF HIGHER EDUCATION	**The first (bachelor)**
THE DEGREE OF HIGHER EDUCATION	**Bachelor**
BRANCH OF KNOWLEDGE	**01 Education/Pedagogy**
SPECIALTY	**015.10 Professional Education (Computer Technologies)**

APPROVED BY THE ACADEMIC COUNCIL

The head of the academic council

/_____ professor, Postolovskii R. M.

(Protocol No. _____ from "_____" _____ 2017)

The educational program is put into effect from ___ 2017

Rector _____ professor, Postolovskii R. M.

(Order No. _____ from "___" _____ 2017)

Rivne, 2017

INTRODUCTION

Educational and professional program in bachelor of the field of knowledge 01 Education / Pedagogy in the specialty 015.10 Professional Education (Computer Technologies) is developed as a temporary document for the implementation of the Standard of Higher Education at the appropriate level of higher education by the design team of Rivne State University of Humanities, consisting of:

Project Team Leader (Educational Program Guarantor):

Nataliya V. Polyukhovich, Ph.D., Associate Professor, Department of Information and Communication Technologies and Computer Science Teaching Methods;

Project Team Members:

Ganna A. Shlikhta, Ph.D., Associate Professor, Department of Information and Communication Technologies and Computer Science Teaching Methods;

Natalia M. Hnedko, Ph.D., Associate Professor, Department of Information and Communication Technologies and Computer Science Teaching Methods;

1. **Educational program profile in the specialty 015.10 Professional Education (Computer Technologies)**

1 - General information	
Full name of higher educational institution and structural unit	Rivne State University of Humanities. Faculty of Mathematics and Informatics.
The degree of higher education and the name of the qualification in the language of the original	Bachelor of Professional Education, Technician-Programmer, Teacher of Computer Disciplines at the Professional Educational Institutions Бакалавр професійної освіти, технік-програміст, викладач комп'ютерних дисциплін професійного навчально-виховного закладу
The official name of the educational program	Professional Education (Computer Technology)
Type of diploma and the volume of the educational program	Bachelor's degree, unitary, 240 ECTS credits, term of study 4 years
Accrediting organization	National Agency of Quality Assurance in Higher Education
Cycle / Level	NQF Ukraine - level 6, FQ-EHEA - first cycle, EQF-LLL - level 6
Prerequisites	Complete secondary education
Language (s) of teaching	State (Ukrainian) language
The duration of the educational program	In accordance with the standard of higher education, but not more than 5 years
Internet address of the permanent description of the educational program	www.fmi-rshu.org.ua
2- The purpose of the educational program	
Training of specialists capable to: - implementation of pedagogical activities in teaching general-technical and special (professional) disciplines in the field of computer technologies; - effective and expedient use of the latest information and communication technologies in the educational process; to carry out development and improvement of software and information provision of educational purposes; - carry out further self-development and professional growth.	
3 - Characteristics of the educational program	
Subject area	*Objects of study and activity:* educational process in the conditions of a professional school; modern information technologies of educational and professional orientation. *Aims of training:* preparation of the teacher of computer disciplines; engineering training in computer technology. *Theoretical content of the subject area:* *Determinations*: information processing, programming, information system architecture, system administration, computer graphics, databases, web technologies; educational activity, professional education, computer technology in education. *Concept:* paradigms, laws, principles, historical background for the development of education; educational innovations; description, research and solutions of a problem or problem by mathematical means with the use of appropriate software, interpretation and practical application of the results.

	Principles: student-centric, competence-oriented, practical-oriented, interdisciplinary, virtualization of education and system structuring of information. *Methods, methodology, technologies and tools*: modern programming technologies; methods of collecting, analyzing and consolidating distributed information; technologies and methods of designing and developing information systems; methods of formalizing scientific and technical, socio-economic problems with the help of software tools; methods of educational sciences on the organization of educational process, the methodology of the formation of subject competences in students and students. *Instruments and equipment:* psychological and pedagogical instruments; information and communication technologies; bases for conducting cross-cutting practices (under cooperation agreements).
Orientation of the educational program	Educational and professional
The main focus of the educational program and specialization	The emphasis is on professional training in the design and development of information models of real systems and processes, software tools, networks and technologies in various fields of science, technology, education and the economy and for the implementation of the educational process in a professional school.
Features of the program	The program is aimed at providing fundamental theoretical and practical training in the field of vocational education and information technologies, including pedagogical, assistant and pre-diploma practice.
4 - Ability of graduates for employment and further training	
Ability for employment	Graduates can work with professions according to the National Classifier of Professions ДК 003: 2010: 2131 Professional in Computing Systems 2132 Professional in programming 3121 Technician-programmer 3340 Other specialists in the field of education 1229.4 Leaders of departments in the field of education and production training 2320 Teachers in secondary schools
Further training	Bachelor in specialty 015.10 Professional educations (Computer technologies) can continue to study programs of the second educational-scientific level.
5 - Teaching and assessment	
Teaching and learning	Teaching on the basis of student-centered and problem-oriented learning with using multimedia lectures, practical and laboratory classes, passing of practices, with the involvement of self-education. - organizational forms of education: collective, group and integrative education; lectures, seminars, practical, laboratory, individual classes, consultations, passing of practice, colloquiums, preparation of baccalaureate work; - learning technologies: information and communication, distance learning, student-centered, modular, simulation, discussion, problem-based learning technologies, technology research training, collaborative learning technology, projective education, self-learning.
Assessment	*Types of control:* current, thematic, modular, total, self-control. *Forms of control:* oral and written surveys, essay, test control, laboratory and individual work protection, defense of practice reports,

	defense of course papers (projects), presentation of scientific, creative work, certification (defense of a qualifying work or a complex examination). *Assessment of educational achievements:* 4-point national scale (excellent, good, satisfactory, unsatisfactory); 2-level national scale (enrolled / not accounted); 100-point system and ECTS scale (A, B, C, D, E, F, FX).
6 - Program competencies	
Integral Competence	Ability to solve complex specialized problems and practical problems in the field of computer sciences and in the process of learning that involves the application of theories and methods of computer science, information technologies and characterized by complexity and uncertainty of the conditions; to solve complex specialized tasks and practical problems in vocational education, which involves the application of theories and methods of educational science and informatics, is characterized by complexity and uncertainty pedagogical conditions of organization of educational process in a vocational school.
General Competences (GC)	1. Ability to exercise their rights and obligations as a member of society, to understand the values of civil society and the need for its development. 2. Ability to preserve and increase the moral, cultural, scientific values and achievements of society on the basis of understanding of the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technology, use different types and forms of motor activity for active rest and healthy lifestyle. 3. Ability to abstract and critical thinking, the use of methods of mental activity. 4. Ability to apply knowledge in practical standard and new situations. 5. Knowledge of lexical, grammatical, stylistic features of state and foreign vocabulary, terminology in the field of information technologies, grammatical structures for the understanding and production of oral and written foreign texts of professional direction. 6. Ability to use information and communication technologies. 7. Ability to learn and master new modern knowledge, motivate people and move towards a common goal. 8. Ability to generate new ideas (creativity), make informed decisions, being proactive. 9. Knowledge of the subject area, ability to identify and shape problems in professional activities and solve them at a professional level. 10. Ability to communicate with representatives of other professional groups of different levels (with experts from other fields of knowledge, types of economic activity). 11. Ability to conduct research at the appropriate level, develop and manage pedagogical projects; evaluate and ensure the quality of work performed. 12. Ability to understand the importance of information in modern society, to carry out information processes, to deal with information security issues with responsibility. 13. Possession of general norms of moral behavior of a person and a group of people, principles of command and autonomous work, readiness to interact with the participants of the educational process

	and social partners, work in an international context, tolerant perception of social, ethno confessional, gender and cultural differences. 14. Possession of the basics of philosophy, national history, economics and law, ecology, contributing to the development of a common culture and socialization of personality, propensity to aesthetic values.
Professional Competences of the Specialty (PC)	1. Ability to mathematical and logical thinking, formulation and research of mathematical models, in particular discrete mathematical models, substantiation of the choice of methods and approaches for solving theoretical and applied problems in the field of computer sciences, interpretation of the obtained results. 2. Ability to form competently, technically, informative educated person, prepared for active labor activity in the conditions of modern high-tech information society. 3. Ability to construct logical conclusions, use of formal languages and models of algorithmic calculations, design, development and analysis of algorithms, evaluation of their efficiency and complexity, solvability and insolubility of algorithmic problems for adequate modeling of subject areas and creation of software and information systems. 4. Ability to design and develop software using various programming paradigms: structural, object-oriented, functional, logical, with appropriate models, methods and algorithms of computing, data structures and management mechanisms. 5. Ability to intelligent multidimensional analysis of data and their operational analytical processing with visualization of the results of analysis in the process of solving applied problems in the field of computer sciences. 6. Ability to provide the organization of computing processes in information systems for different purposes, taking into account architecture, configuration, performance indicators of the operation of operating systems and system software. 7. Ability to implement high-performance computing based on cloud services and technologies, parallel and distributed computing in the development and operation of distributed systems of parallel processing of information. 8. Ability to use vocational training techniques for vocational education at a lower level than higher education. 9. Ability to use modern methods of organization of classroom classes, to organize independent and scientific work and to organize educational work of students. 10. Ability to conduct organizational and educational activities, to determine the content and volume of classroom work and independent work of students, to use modern technical means of teaching during the teaching activity. 11. Ability to plan, control and analyze learning outcomes. 12. Ability to implement a multi-level computing model based on client-server architecture, including databases, data warehouses and knowledge bases, to provide computing needs of many users, transaction processing, including cloud services. 13. Ability to develop network software, which operates on the basis of different topologies of structured cabling systems, uses computer

	systems and data networks and analyzes the quality of computer networks. 14. Ability to apply methods and means of information security, develop and operate a special software for protecting the information resources of critical information infrastructure objects. 15. Ability to enter and process text, graphical and multimedia information in the structure of the design process. 16. Ability to use computer methods of constructing two-dimensional and three-dimensional images and graphical presentation of visual material, model-model materials and technologies for their processing. 17. The ability, on the basis of regularities, methodologies and principles of designing design objects, to design a design image and the volume-spatial structure of design objects of graphic design (printing products, media, media spaces, etc.) and objects environment (physical bodies, objects, interiors of buildings, etc.).
7 - Program learning results	
Knowledge	1. Knowledge of the basic forms and laws of abstract-logical thinking, the basics of logic, the norms of the critical approach, the basics of the methodology of scientific knowledge, the forms and methods of analysis and synthesis, knowledge of methods, methods and technologies of information gathering from various sources, content analysis of documents, analysis and data processing. 2. Knowledge of lexical, grammatical, stylistic features of state and foreign vocabulary, terminology in the field of computer sciences, grammatical structures for the understanding and production of oral and written foreign texts in the professional field. 3. Knowledge of the principles of team work, team values, basics of conflictology, methodology of IT project management, knowledge of the system of general norms of moral behavior of a person and a group of people, ethical principles, understanding of the code of professional ethics. 4. Knowledge of theoretical and applied provisions of continuous and discrete analysis, numerical methods of linear and nonlinear algebra, approximation of functions, methods of numerical differentiation and integration of functions, solving of ordinary differential and integral equations, solution of equations in partial derivatives, theoretical peculiarities of numerical methods and possibilities their adaptation to engineering tasks, knowledge of basic concepts of mathematical statistics, methods of processing empirical data. 5. Knowledge of basic concepts of the theory of algorithms, formal algorithms, data structures and fundamental algorithms, methodologies and tools of object-oriented analysis and design, features of various programming paradigms, principles, models, methods and technologies of designing and developing software products of various purposes. . 6. Knowledge of computer architecture, functions of operating systems (OS), software interfaces for access of applications to OS, system programming languages and methods of developing programs interacting with components of computer systems. 7. Knowledge of technologies for setting up and maintaining and operating platforms for distance learning, principles of designing a distance course, knowledge of the possibilities of information and

	communication technology and technical means in the educational process and research activities. 8. Knowledge of methods of vocational training for a vocational school, knowledge of modern methods of organization of classroom and non-auditoria classes, educational and scientific work in institutions of vocational schools. 9. Knowledge of standards, methods, technology and process management lifecycle information and software systems, products and services, information technology, knowledge of international standards for quality assessment software, services and IT management services, valuation models mature software development processes for educational purposes and methods quality assurance of educational IT systems. 10. Knowledge of principles, tools, languages, web programming, technology for creating databases based on client-server architecture, knowledge of methodology and technology of designing complex systems, CASE-system design tools, methods of structural analysis of systems, object-oriented design methodology, documentation of the project, methodology for evaluating the complexity of complex systems development. 11. Knowledge of network technologies, architecture of computer networks, technology of computer network administration and their software in the process of distributed computing, knowledge of the concept of information security, principles of safe design of IP and IT, safe programming methods, threats and attacks, security of the comp computer networks, methods of cryptography. 12. Knowledge of the main provisions of the theory of composition and geometric modeling, color theory and modern concepts of their use in graphic design and design of the environment, technical means of computer design, knowledge of the features of work with raster and 3D graphics, features of work in raster graphics programs.
Ability	13. To obtain systematic knowledge in the field of computer sciences, to analyze problems from the point of view of modern scientific paradigms, to comprehend and make grounded conclusions from scientific and educational literature and experiment results, to use technologies and tools of search engines, methods of intellectual analysis of data and texts, to carry out processing, interpreting and aggregating data. 14. Professionally communicate in state and foreign languages, to develop documentation in systems of state and foreign languages on systems, products and services of information technologies, to read, understand and apply technical documentation in Ukrainian and foreign languages in professional activity. 15. To select and prepare information and tasks for the project team, to set goals and formulate tasks for implementation of projects and programs. 16. Effectively use modern mathematical apparatus in professional activity to solve problems of a theoretical and applied nature in the process of analysis, synthesis and design of information systems by industry. 17. To use formal models of algorithms and computational functions, to establish solvability, partial solvability and insolubility of algorithmic problems, to design, develop and analyze algorithms, estimation of their efficiency and complexity.

	18. To develop software modeling of subject environments, to choose the programming paradigm from the point of view of convenience and quality of application for realization of methods and algorithms for solving problems in the field of computer sciences, to create reliable and efficient software. 19. To use methods, technologies and tools for designing and developing client-server applications, to design conceptual, logical and physical models of databases, to develop and optimize their requests, to create distributed databases, repositories and showcases of data, knowledge bases, in that including cloud services. 20. Ability to conduct organizational and educational activities, to determine the content and volume of classroom work and independent work of students, to use modern technical means of teaching during the teaching activity, to plan, control and analyze the results of training. 21. To use the methodologies, technologies and tools of life cycle management of information systems, in accordance with the requirements of the customer, the ability to prepare the project documentation, apply international standards for the assessment of software quality, management and service of IT services, models for assessing the maturity of software development processes. 22. To be able to set up and maintain educational software and operational systems installed at educational institutions, use information and communication technologies and technical means in the educational process and research activities. 23. To solve the problems of administration, effective use, safety, diagnosis, restoration, monitoring and optimization of computers, operating systems and system resources of computer systems, to possess methods and means of work with computer networks; choose the configuration, type and structure of the computer network; exploit computer networks in the process of distributed computing. 24. Use computer design knowledge in everyday life and work, knowledge of the features and capabilities of modern software tools for computer design.
Communication	25. The possession and use of vocabulary-syntactic models typical for professional communication, construction of communication in oral and written form in state and foreign languages, based on the purposes and the situation of communication. 26. Use of document and information communication system to meet information needs in the field of computer science and information technologies. 27. Implementation of professional communication contacts, understanding of interlocutors, psychological influence in the communication process, adequate understanding of verbal and nonverbal communicative signals, ability to overcome communicative barriers.
Autonomy and responsibility	28. Able to study throughout life and improve with a high level of autonomy obtained during the training of competence. 29. Organization of their work for the achievement of results, the implementation of mental and practical actions, techniques and operations, awareness of responsibility for the results of their activities, the use of self-control and self-esteem.
8 − Resource support for the implementation of the program	

Personnel support	Conducting lectures on educational disciplines by scientific and pedagogical workers of the corresponding specialty having a degree and / or academic rank and working at their main place of work is more than 50% of the number of hours determined by the curriculum.
Material and technical support	Material and technical support meets the licensing requirements for providing educational services in the field of higher education and is sufficient to ensure the quality of the educational process. Cathedrals with appropriate equipment and inventory, six computing laboratories equipped with computer equipment, integrated into a local area network connected to the Internet; multimedia class and four multimedia projectors, screens. According to the agreement on participation of the University in the Microsoft Developer Network Academic Alliance, the following training software is provided by Microsoft on licensed software: - Operating systems of the MS Windows family (Windows 98 SE, Windows 2000 Professional Edition, Windows XP Professional Edition, Windows 2003 Advanced Server Standard Edition) and SlackWare Linux 14; - Microsoft SQL Server 2012 Std database servers. R2; Visual Visual Studio 2012 visual programming environments; - Microsoft Visual FoxPro 9; - Visual Design Tools for MS Office Visio; - Office suite package LibreOffice; Microsoft Office 2013 Pro Plus Other software is used freely and does not require licensing
Information and teaching and methodological support	Use of the virtual learning environment of the Rivne State Humanitarian University and the author's development of the teaching staff.
9 − Learning Mobility	
National Credit Mobility	It is regulated by the Resolution of the Cabinet of Ministers of Ukraine No. 579 "On Approval of the Regulations on the Implementation of the Right to Academic Mobility" of August 12, 2015.
International Credit Mobility	On the basis of bilateral agreements between Rivne State University of Humanities and foreign educational institutions.
Teaching foreign applicants for higher education	Possible.

3. Form of certification of higher education applicants

Certification of graduates of the educational program in the specialty 015.10 Professional education (Computer technologies) is carried out in the form of defense of a qualification bachelor's work or taking a complex examination on specialty and ends with the issuance of the document of the established sample on awarding a bachelor's degree with the qualification: a bachelor of professional education, a technician-programmer, teacher of computer disciplines of a professional educational institution.

The certification is carried out openly and publicly.

6. System of internal quality assurance of higher education

The system of providing quality of educational activity and higher education (the system of internal providing activity) by the higher educational establishment functions in Rivne State University of Humanities and it foresees the realization of such procedures and measures:

1) definition of principles and procedures of providing quality of higher education;
2) realization of monitoring and periodic revision of the educational programs;
3) an annual assessment of graduates scientific and pedagogical employees of a higher educational institution, and regular promulgation of the results of such assessments are on the official website of the higher educational establishment, on informative stands and in any other way;
4) providing certification training of pedagogical, research and scientific and pedagogical employees;
5) providing availability of necessary resources for the organization of educational process, including individual work of graduates on each educational program;
6) providing availability of informative systems for effective educational process control;
7) providing publicity of information about the educational programs, degrees of higher education and qualification;
8) providing the effective system of preventing and revealing academic plagiarism in scientific works of higher educational establishment employees and graduates;
9) other procedures and measures.

The system of providing higher education institutions with the quality of educational activity and the quality of higher education (the system of internal quality assurance) may, upon submission of the Rivne State University of Humanities, be assessed by the National Agency for the Quality Assurance of Higher Education or independent institutions accredited by it, for the assessment and quality assurance of higher education on the subject of its compliance with the requirements systems of quality assurance in higher education, approved by the National Agency for the Quality Assurance of Higher Education, and to international standards and recommendations for the quality assurance of higher education.

Guarantor of the educational program,
Head of the project group Nataliya V. Polyukhovich.

In addition, there is a list of components of the OP and their structural and logical scheme, as well as an explanatory note to the OP