

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE  
THE NATIONAL UNIVERSITY OF OSTROH ACADEMY

**EDUCATIONAL-PROFESSIONAL PROGRAMME**  
**"COMPUTER SCIENCE"**  
**of the first (Bachelor's) level of higher education**

in the 'F3 Computer Science' Speciality  
Field of study: 'F - Information Technology'

**Ostroh 2025**

## Profile of the Educational and Professional Programme in the 'F3 Computer Science' Speciality

| 1 - General Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                       |
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| <b>Full name of the higher education institution and structural unit</b>                                                                                                                                                                                                                                                                                                                                                                                                                      | The National University of Ostroh Academy<br>Educational and Scientific Institute of Information Technology and Business<br>The Information Technology and Data Analytics Department                                  |
| <b>Degree of higher education and title of qualification in the original language</b>                                                                                                                                                                                                                                                                                                                                                                                                         | Bachelor.<br>Bachelor of Computer Science.                                                                                                                                                                            |
| <b>Official title of the educational programme</b>                                                                                                                                                                                                                                                                                                                                                                                                                                            | Educational-professional programme "Computer Science"                                                                                                                                                                 |
| <b>Type of the diploma and scope of the educational programme</b>                                                                                                                                                                                                                                                                                                                                                                                                                             | Bachelor's Diploma, single degree, 240 ECTS credits,                                                                                                                                                                  |
| <b>Forms of study under the educational programme and the standard duration of study for each form</b>                                                                                                                                                                                                                                                                                                                                                                                        | Full-time form of study:<br>- standard duration of study: 3 years and 10 months                                                                                                                                       |
| <b>Accreditation status</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Accreditation certificate of the EP № 3328. Date of issue of the certificate - 20.05.2022. Valid until - 01.07.2027.                                                                                                  |
| <b>Cycle/Level</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Ukrainian NQF – Level 6,<br>FQ-EHEA – First cycle, EQF-LLL – Level 6                                                                                                                                                  |
| <b>Prerequisites</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Complete General Secondary Education, in compliance with the Admission Regulations of the National University of Ostroh Academy for the current year.                                                                 |
| <b>Language(s) of Instruction</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Ukrainian, English                                                                                                                                                                                                    |
| <b>Validity Period of the Educational Programme</b>                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2025-2029                                                                                                                                                                                                             |
| <b>Permanent Internet Address of the Educational Programme Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                    | <a href="https://www.oa.edu.ua/ua/osvita/ects/info_prog/bachelor/ekonomichnij_fakultet/122-kompyuterni-nauki">https://www.oa.edu.ua/ua/osvita/ects/info_prog/bachelor/ekonomichnij_fakultet/122-kompyuterni-nauki</a> |
| 2 – The EPP Purpose:                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                       |
| <p>Fundamental training of specialists in the field of computer science who are capable of designing and developing computer software for business, society, and government tasks using various programming paradigms, development tools, databases, and data warehouses.</p> <p>The Computer Science educational programme aims to train qualified specialists who can work successfully in the modern information environment and serve as innovators in the field of computer science.</p> |                                                                                                                                                                                                                       |
| 3 – EEP Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                       |
| <b>Subject Area (field of study, speciality, specialisation)</b>                                                                                                                                                                                                                                                                                                                                                                                                                              | Field of study: F Information Technology<br>Speciality: F3 Computer Science. According to the International Standard Classification of Education – 0613 Software and Applications Development and Analysis.           |

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|                                          | <p><i>Object(s) of Study and/or Professional Activity:</i><br/>Mathematical, informational, and simulation models of real phenomena, objects, systems, and processes; domain-specific models; data and knowledge representation; methods and technologies for obtaining, storing, processing, transmitting, and using information; methods of intelligent data analysis and decision-making; theory, analysis, development, performance evaluation, and implementation of algorithms; high-performance computing, including parallel computing and big data.</p> <p><i>Learning Objectives:</i><br/>training specialists capable of conducting theoretical and experimental research in the field of computer science; applying mathematical algorithmic principles, model designing, developing, and maintaining technologies; developing, implementing, and maintaining intelligent systems for data and processing within organisational, technical, natural, and socio-economic systems mathematical, informational, and simulation models of real phenomena, objects, systems, and processes; domain-specific models; data and knowledge representation; methods and technologies for obtaining, storing, processing, transmitting, and using information; methods of intelligent data analysis and decision-making; theory, analysis, development, performance evaluation, and implementation of algorithms; high-performance computing, including parallel computing and big data.</p> <p><i>Theoretical Content of the Subject Area:</i><br/>modern models, methods, algorithms, technologies, processes, and approaches to acquiring, representing, processing, analysing, transmitting, and storing data in information systems.</p> <p><i>Methods, Techniques and Technologies:</i><br/>mathematical models, methods, and algorithms for solving theoretical and applied problems arising in IT development; modern programming technologies and platforms; methods of collecting, analysing, and consolidating distributed information; technologies and methods for designing, developing, and ensuring the quality of IT components; methods of computer graphics and data visualisation technologies; knowledge engineering technologies, and CASE technologies for modeling and designing information technologies.</p> <p><i>Tools and Equipment:</i><br/>distributed computing systems; computer networks; mobile and cloud technologies; database management systems; operating systems.</p> |
| <b>Type of the Educational Programme</b> | <p>An educational and professional programme, academic and practice-oriented, based on modern provisions and results of scientific research and applied results in the field of software design, including requirements analysis, modelling, software architecture selection and design, verification, testing, software project management, and working in teams of programmers. Thorough knowledge and practical skills in designing complex information systems are developed.</p> <p>The Scope of the Educational and Professional Programme is <b>240 ECTS credits</b>, including:</p> <ul style="list-style-type: none"> <li>- <b>compulsory components of the EPP - 73.7%, including 10.8% of general training, 52.9% of professional training, and 10.0% of practical training.</b></li> <li>- <b>elective components of the EPP - 26.3 %.</b></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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| <b>The Primary Focus of the Educational Programme</b>               | <p>Specialised education in the field of information technology, which involves fundamental study and acquisition of practical skills and abilities in the areas of development, design, architecture selection, verification, software testing, information systems, and management of software projects and information protection systems.</p> <p><i>Key words:</i> information technology, information systems, computer software, development, design, verification, testing, architecture, software projects.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Distinctive Features of the Programme</b>                        | <p>Acquisition of professional competencies necessary for deep mastering modern professional knowledge and skills in information and computer technologies and software development, in combination with intelligent technologies of data analysis and business analytics, with English language study to further integrate into the IT-sphere.</p> <p>In their first year, students complete <i>an internship in the discipline "Programming Basics"</i>, and in their second year, <i>they complete an internship in the discipline "C # Programming"</i>, as a result of which they consolidate their skills in programming in C++ and C#; methods of designing, developing, and maintaining application programmes.</p> <p>In their third and fourth years, students undertake a work experience internship, during which they acquire practical skills in the IT field.</p> <p>In addition, in their fourth year, students write a qualifying paper/project that involves theoretical, systematic, or experimental research on a complex, specialised assignment or practical problem in computer science, characterised by complexity and uncertainty, and requires the use of information technology theories and methods.</p>                                                                                                                 |
| <b>4 - Alumni Employability and Opportunities for Further Study</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Employability</b>                                                | <p>Bachelor of Computer Science graduates are capable of developing information software and software for information systems in the field of information technology, as well as managing databases and systems, implementing all stages of software development for customers, designing software tools, testing, installing, supporting, and maintaining.</p> <p>Bachelor in Computer Science, according to the National Classifier of Occupations, DK 003:2010, may hold the following positions:</p> <p><i>2/3 Professionals in the field of Computing:</i></p> <p>2131.2 Database Administrator<br/> 2131.2 Data Administrator<br/> 2131.2 Access Administrator<br/> 2131.2 System Administrator<br/> 2131.2 Computer Software Engineer<br/> 2131.2 Software Engineer<br/> 2131.2 Programmer (database)<br/> 2131.2 Application Programmer</p> <p><i>2/3 Computer Applications Engineer</i></p> <p><i>3/2 3121. Technical Specialists in Computer Engineering:</i></p> <p>3121. Expert in Information Technologies,<br/> 3121. Computer Graphics (design) Specialist<br/> 3121. Software Development and Testing Specialist<br/> 3121. Computer Program Development Specialist</p> <p><i>3/3. Technical Specialists in Management:</i></p> <p>3439. Restricted Information Protection Specialist<br/> 3439. Information Security Specialist.</p> |

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| <b>Further Study</b>               | The graduates are entitled to continue their studies at the second (Master's) level of higher education and acquire additional qualifications within the postgraduate education system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>5 - Teaching and Assessment</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Teaching and Learning</b>       | <p><b>Types of learning:</b> student-centred, problem-based learning, and self-directed learning.</p> <p><b>Teaching methods:</b> a combination of lectures, practical and laboratory classes with discussion of the most pressing issues, solving situational problems and using modern information technologies, case methods, business games, and training sessions that develop analytical abilities and teamwork skills.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Assessment</b>                  | <p>Assessment of a student's learning achievements is carried out using the institution's 100-point grading system, which involves accumulating points for all types of academic activities undertaken by the student.</p> <p>Assessment results are recorded in academic transcripts according to the national and international (ECTS) grading scales: A – Excellent (91–100 points), B – Good (83–90.9 points), C – Good (76–82.9 points), D – Satisfactory (68–75.9 points), E – Satisfactory (61–67.9 points), FX – Fail, with the possibility of retaking (20–60.9 points), F – Fail, requiring mandatory taking the course (0–19.9 points).</p> <p><b>Types of assessment:</b> ongoing, mid-term, final, and self-assessment.</p> <p><b>Forms of assessment:</b> written and oral tests, exams, reports, and public defences of individual and group projects, oral presentations.</p> <p><b>Final assessment:</b> exams, tests, coursework and internship defences.</p> <p><b>Final academic assessment:</b> defence of the qualifying paper.</p>                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>6 – Programme Competencies</b>  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Integral competence</b>         | The ability to solve complex, specialised, and practical problems in the field of computer science or in the process of learning that involves the application of theories and methods of information technology, and is characterised by the complexity and uncertainty of the conditions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>General Competencies (GC):</b>  | <p>GC1. Ability for abstract thinking, analysis, and synthesis.</p> <p>GC2. Ability to implement knowledge in practical situations.</p> <p>GC3. Knowledge and understanding of the subject area, as well as awareness of professional practices.</p> <p>GC4. Ability to communicate fluently in the state language both orally and in writing.</p> <p>GC5. Ability to communicate in a foreign language.</p> <p>GC6. Ability to learn and master modern knowledge.</p> <p>GC7. Ability to search, process and analyse information from various sources.</p> <p>GC8. Ability to generate new ideas (creativity).</p> <p>GC9. Ability to work in a team.</p> <p>GC10. Ability to be critical and self-critical.</p> <p>GC11. Ability to make well-founded decisions.</p> <p>GC12. Ability to evaluate and ensure the quality of work performed.</p> <p>GC13. Ability to act based on ethical reasoning.</p> <p>GC14. Ability to exercise one's rights and responsibilities as a member of society, to recognise the values of a civil (free and democratic) society and the necessity of its sustainable development, as well as the rule of law and human and citizen rights and freedoms in Ukraine.</p> <p>GC15. Ability to preserve and enhance the moral, cultural, and scientific values and achievements of society based on an understanding of the history and patterns of development of the subject area, its place within the</p> |

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|                                                            | <p>overall system of knowledge about nature and society, and its role in the development of society, technology, and engineering; ability to utilise various types and forms of physical activity for active recreation and maintaining a healthy lifestyle.</p> <p>GC16. Ability to make decisions and act in accordance with the principle of zero tolerance for corruption and any other forms of dishonesty.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Special (professional, subject-specific) competencies (SC) | <p>SC1. Ability to mathematically formulate and investigate continuous and discrete mathematical models, justify the choice of methods and approaches for solving theoretical and applied problems in the field of computer science, and analyse and interpret results.</p> <p>SC2. Ability to identify statistical patterns in indeterminate phenomena, apply computational intelligence methods—including statistical, neural network, and fuzzy data processing techniques, as well as machine learning and genetic programming methods, among others.</p> <p>SC3. Ability for logical thinking, drawing logical conclusions, using formal languages and models of algorithmic computations, designing, developing, and analysing algorithms, evaluating their efficiency and complexity, as well as the solvability and unsolvability of algorithmic problems, for adequate modelling of subject areas and creation of software and information systems.</p> <p>SC4. Ability to apply modern methods of mathematical modelling of objects, processes, and phenomena; develop models and algorithms for the numerical solution of mathematical modelling problems; and account for errors arising from approximate numerical solutions of professional tasks.</p> <p>SC5. Ability to perform a formalised description of operations research problems in organisational, technical, and socio-economic systems of various purposes; determine their optimal solutions; develop models of optimal management considering changes in the economic situation; and optimise management processes in systems of different purposes and hierarchical levels.</p> <p>SC6. Ability for systemic thinking, applying the methodology of systems analysis to investigate complex problems of various nature, and using methods for formalisation and solving systems problems that involve conflicting objectives, uncertainty, and risks.</p> <p>SC7. Ability to implement the theoretical and practical foundations of modelling methodology and technology to study the characteristics and behaviour of complex objects and systems, and to conduct computational experiments with processing and analysis of results.</p> <p>SC8. Ability to design and develop software using various programming paradigms—imperative, object-oriented, functional, and logic programming—with corresponding models, methods and algorithms of computation, data structures, and control mechanisms.</p> <p>SC9. Ability to implement a multi-tier computational model based on client-server architecture, including databases, knowledge bases, and data warehouses; perform distributed processing of large datasets on clusters of standard servers to meet users' computational needs, including using cloud services.</p> <p>SC10. Ability to implement methodologies, technologies, and tools for managing the lifecycle processes of information and software systems, products, and IT services in accordance with customer requirements.</p> <p>SC11. Ability to perform intelligent data analysis using computational intelligence methods, including large and unstructured datasets, carry out</p> |

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|                                        | <p>real-time data processing, and visualise analysis results in the course of solving applied problems.</p> <p>SC12. Ability to organise computational processes in information systems of various purposes, taking into account architecture, configuration, performance indicators of operating systems, and system software.</p> <p>SC13. Ability to develop network software operating on various structured cabling system topologies, utilising computer systems and data transmission networks, and analysing the performance of computer networks.</p> <p>SC14. Ability to implement methods and tools for information security, and to develop and operate specialised software for protecting the information resources of critical information infrastructure objects.</p> <p>SC15. Ability to analyse and functionally model business processes, develop and practically apply functional models of organisational-economic and production-technical systems, and use methods for assessing the risks of their design.</p> <p>SC16. Ability to implement high-performance computing using cloud services and technologies, as well as parallel and distributed computing, in the development and operation of distributed information processing systems.</p> <p>SC17. Ability to configure and effectively use continuous integration and continuous deployment in software development and deployment.</p> <p>SC18. Ability to design and develop interactive interfaces on REACT.</p> <p>SC19. Ability to manage the process and integrate into the collective software development process.</p>                                                                                                                                                                                            |
| <b>7 - Programme Learning Outcomes</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                        | <p>PLO1. To apply the knowledge of primary forms and norms of abstract-logical thinking, the framework methodology of scientific cognition, and the forms and methods of extraction, analysis, processing, and synthesis of information in the topic field.</p> <p>PLO2. To utilise modern mathematical tools, including continuous and discrete analysis, linear algebra, and analytical geometry, in professional activities focused on solving theoretical and applied problems in the design and implementation of information technology facilities.</p> <p>PLO3 To use knowledge of random phenomena laws, their properties and operations with them, models of random processes and modern software environments to solve statistical data processing problems and build predictive models.</p> <p>PLO4. To utilise methods of computational intelligence, including machine learning, neural networks, fuzzy data processing, and genetic and evolutionary programming, to solve problems such as recognition, prediction, classification, and identification of control objects.</p> <p>PLO5. To design, develop, and analyse algorithms for solving computational and logical problems, and evaluate the efficiency and complexity of these algorithms based on formal models of algorithms and computational functions.</p> <p>PLO6. To use methods of numerical differentiation and integration of functions, solution of ordinary differential and integral equations, features of numerical methods and the possibility of their adaptation to engineering problems, to have skills in software implementation for numerical methods.</p> <p>PLO7. To understand the principles of modelling organisational and technical systems and operations, using operations research methods, and</p> |

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|                                                       | <p>solving single- and multicriteria optimisation problems of linear, integer, nonlinear, and stochastic programming.</p> <p>PLO8. To apply the systems analysis methodology of objects, processes and systems for analysing, forecasting, managing and projecting dynamic processes in economic, technical, technological and financial entities.</p> <p>PLO9. To develop software models of subject environments, select a programming paradigm based on convenience and application quality to implement methods and algorithms for solving problems in computer science.</p> <p>PLO10. To use tools for developing client-server applications, designing conceptual, logical and physical models of databases, developing and optimising queries, creating distributed databases, repositories and storefronts of data knowledge bases, including cloud services, using web programming languages.</p> <p>PLO11. To possess skills in managing the life cycle of software, products, and services of information technology, following the requirements and restrictions of the customer, as well as to develop project documentation (feasibility study, terms of reference, business plan, agreement, contract).</p> <p>PLO12. To apply methods and algorithms of computational intelligence and data mining in the problems of classification, forecasting, cluster analysis, and search for associative rules using software tools to support multidimensional data analysis based on DataMining, TextMining, and WebMining technologies.</p> <p>PLO13. To know the languages of system programming and software development methods that interact with the components of computer systems, to understand network technologies and architectures, and to have practical skills in computer network administration technology and the relevant software.</p> <p>PLO14. To apply knowledge of methodology and CASE tools for designing complex systems, methods of structural analysis of systems, and object-oriented design methodology in developing and studying functional models of organisational-economic and production-technical systems.</p> <p>PLO15. To understand the concept of information security, the principles of safe software design, and ensure the security of computer networks in conditions of incomplete and uncertain source data.</p> <p>PLO16. To perform parallel and distributed calculations, implement numerical methods and algorithms for similar structures, and parallel programming languages to develop and operate parallel and distributed software.</p> <p>PLO17. Design, develop, and deploy cross-platform applications and services on the .NET platform, supporting operating systems, the web, and mobile devices.</p> <p>PLO18. Utilise modern JavaScript-based frameworks to develop both server-side and client-side applications.</p> <p>PLO19. Possess skills in managing the collective software development process and be able to perform the functions of a participant in this process.</p> <p>PLO20. To implement acquired knowledge to prevent corruption and any forms of dishonesty in the field of computer science.</p> |
| <b>8 – Resources for the Programme Implementation</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Human Resources                                       | The department responsible for training within the educational and professional programme is the Information Technology and Data Analytics Department. The qualifications of the academic and teaching staff fully                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

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|                                        | <p>comply with the licensing requirements for educational activities, as approved by Resolution No. 1187 of the Cabinet of Ministers of Ukraine dated December 30, 2015.</p> <p>The organisation of the educational process involves the engagement of professional practitioners.</p> <p>Special attention is given to the continuous professional development and internship training of the academic staff responsible for ensuring the educational process.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Material and Technical Support         | <p>The educational process is conducted in the institution's own teaching facilities, which have a total area of 9,170.7 m<sup>2</sup>, including lecture and classroom facilities (8,324.4 m<sup>2</sup>) and computer laboratories (846.3 m<sup>2</sup>). All lecture halls are equipped with Acer P1525 multimedia projectors and Elite Screens Electric100V projection screens; three halls are equipped with Edifier X3 acoustic systems. Students have free access to the global Internet.</p> <p>Computer laboratories are equipped with various operating systems, including application software packages and software development environments such as Visual Studio Community Edition, JetBrains Rider, MS SQL Server, SQL Server Management Studio, Visual Studio Code, Git, GitHub Desktop, PyCharm, MySQL, and Java.</p> <p>The university's social infrastructure comprises nine student dormitories (9,218.9 m<sup>2</sup>), four sports halls (503.8 m<sup>2</sup>), a stadium, sports grounds, and tennis courts (with a total area of 9,430 m<sup>2</sup>).</p> <p>The material and technical support for organising the educational process of the educational-professional programme complies with the Licensing Conditions for Educational Activities, approved by the Resolution of the Cabinet of Ministers of Ukraine No. 1187 dated December 30, 2015, and with the State Building Codes of Ukraine for "Buildings and Structures. Educational institutions. State Building Code of Ukraine DNB V.2.2-3:2018".</p>                                                                                   |
| Information and Methodological Support | <p>For the training of highly qualified specialists, the National University of Ostroh Academy has a computerised scientific library equipped with modern hardware and software, as well as textbooks, monographs, and journals. The library has an automated library system (ILS) Koha (<a href="https://koha.oa.edu.ua/">https://koha.oa.edu.ua/</a>), which contains resources of various types, purposes, and access levels. Full access to the digital resources of the Scientific Library is available to users with an account in the oa.edu.ua domain.</p> <p>The structural units of the electronic library are:</p> <ol style="list-style-type: none"> <li>1) The LitPro information system, which contains a complete list of recommended literature for all disciplines (<a href="http://litpro.oa.edu.ua/">http://litpro.oa.edu.ua/</a>) (in-house development);</li> <li>2) Digital archive/repository of the NaUOA (<a href="http://eprints.oa.edu.ua/">http://eprints.oa.edu.ua/</a>, public access);</li> <li>3) Electronic archive of theses and qualification works of NaUOA (<a href="http://theses.oa.edu.ua/">theses.oa.edu.ua/</a>, combined access);</li> <li>4) Electronic collections of classical music (<a href="http://lib.oa.edu.ua/funds/music/">http://lib.oa.edu.ua/funds/music/</a>, combined access);</li> <li>5) Electronic index of scientific works by the academic staff of the NaUOA, public access);</li> <li>6) Other resources (CD/DVD collections, event management systems, combined access).</li> </ol> <p>The methodological support of the educational process is provided</p> |

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|                                                      | <p>through educational and methodological complexes for each discipline, including methodological guidelines for completing coursework, qualifying (diploma) papers, and internships. Distance learning is facilitated through the Moodle information system (<a href="https://moodle.oa.edu.ua/">https://moodle.oa.edu.ua/</a>).</p> <p>The information and methodological support for organising the educational process of the educational-professional programme complies with the Licensing Conditions for Educational Activities, approved by the Resolution of the Cabinet of Ministers of Ukraine No. 1187 dated December 30, 2015.</p> |
| 9 – Academic Mobility                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| National Credit Mobility                             | Students have the opportunity to participate in national credit mobility based on agreements concluded by the National University of Ostroh Academy with other higher education institutions.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| International Credit Mobility                        | <p>Students have the opportunity to participate in international academic mobility programmes based on cooperation agreements concluded by the NaUOA with over 90 universities worldwide, as well as within the Erasmus+ programme.</p> <p>Partner institutions include the University of St Andrews (Scotland), Klaipėdos Valstybinė Kolegija/Higher Education Institution (Lithuania), the University of Beira Interior (Portugal), and Uniwersytet Pomorski w Słupsku (Poland).</p>                                                                                                                                                          |
| Organisation of Education for International Students | Education of foreign citizens under accredited educational programmes at the National University of Ostroh Academy is carried out in accordance with the Regulations on the Education of Foreigners and Stateless Persons at the National University of Ostroh Academy and the Admission Rules of the National University of Ostroh Academy for the current year.                                                                                                                                                                                                                                                                               |

## 2. List of components of the Educational and Professional Programme in the 'F3 Computer Science' Speciality

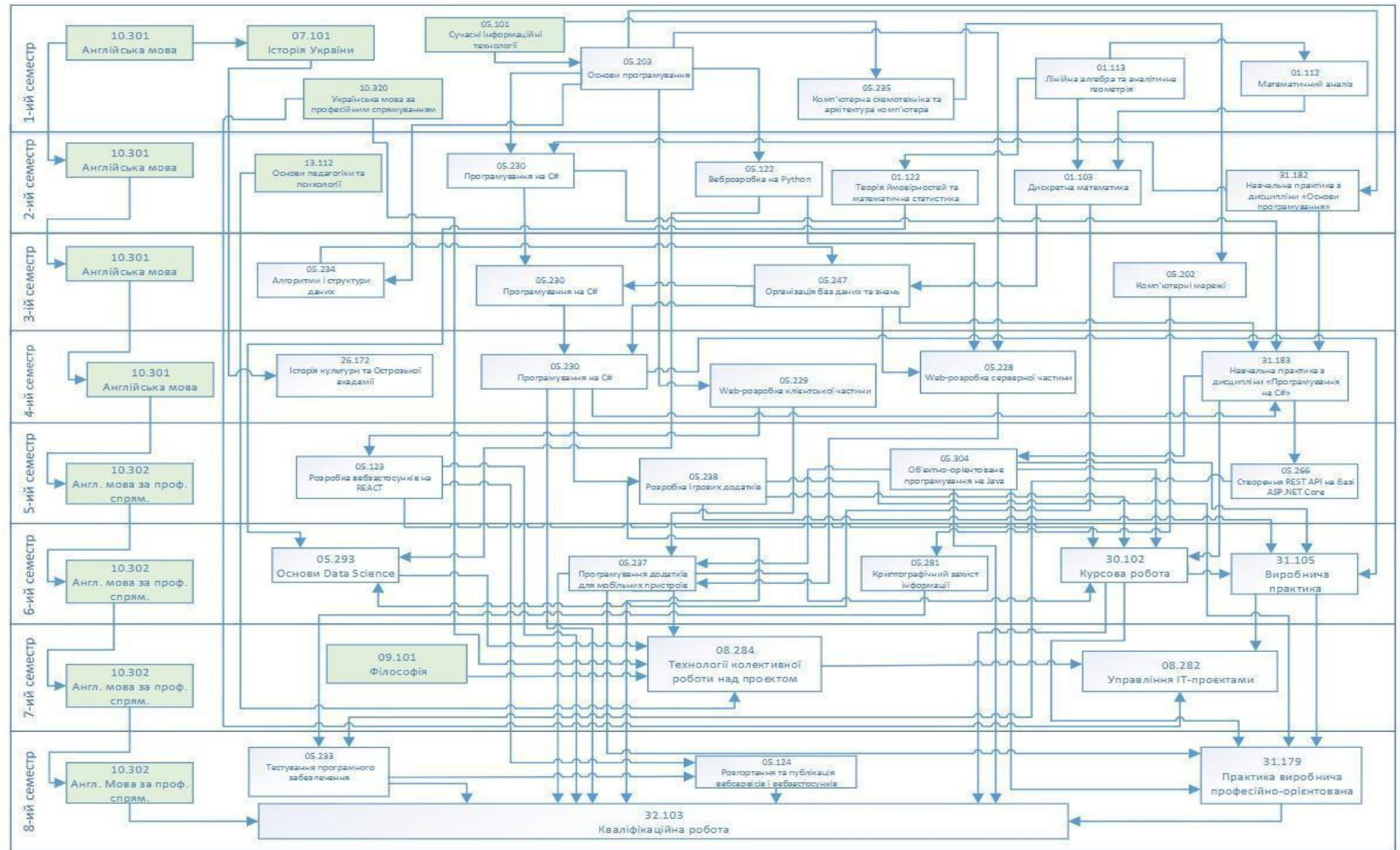
### 2.1. The components of the educational-professional programme

| Component Code                             | Components of the educational-professional programme (academic disciplines, coursework/projects, internships, qualifying paper/project) | Number of credits | Form of final assessment |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------|
| <b>I. Compulsory components of the EPP</b> |                                                                                                                                         |                   |                          |
| <b>1.1. General Training Cycle</b>         |                                                                                                                                         |                   |                          |
| 10.301                                     | English Language                                                                                                                        | 14                | Exam                     |
| 07.101                                     | History of Ukraine                                                                                                                      | 3                 | Exam                     |
| 09.101                                     | Philosophy                                                                                                                              | 3                 | Exam                     |
| 10.320                                     | Ukrainian Language (for professional purposes)                                                                                          | 3                 | Exam                     |
| 13.112                                     | Fundamentals of Pedagogy and Psychology                                                                                                 | 3                 | Pass/Fail                |
| 26.172                                     | History of Culture and of Ostroh Academy                                                                                                | 3                 | Pass/Fail                |
| 05.101                                     | Modern Information Technology                                                                                                           | 3                 | Pass/Fail                |
|                                            | <b>Total</b>                                                                                                                            | <b>32</b>         |                          |
| <b>1.2. Professional Training Cycle</b>    |                                                                                                                                         |                   |                          |
| 10.302                                     | English Language (in the professional sphere)                                                                                           | 12                | Exam                     |
| 01.112                                     | Mathematical Analysis                                                                                                                   | 5                 | Exam                     |
| 01.122                                     | Theory of Probabilities and Mathematical Statistics                                                                                     | 5                 | Exam                     |
| 05.265                                     | Programming in Python                                                                                                                   | 5                 | Pass/Fail                |
| 05.203                                     | Programming Basics                                                                                                                      | 5                 | Exam                     |
| 01.103                                     | Discrete Mathematics                                                                                                                    | 4                 | Pass/Fail                |
| 05.230                                     | C # Programming                                                                                                                         | 12                | Exam                     |
| 05.234                                     | Data Structures and Algorithms                                                                                                          | 3                 | Exam                     |
| 01.113                                     | Linear Algebra and Analytical Geometry                                                                                                  | 3                 | Pass/Fail                |
| 05.235                                     | Computer-Aided Circuit Engineering and Computer Architecture                                                                            | 3                 | Pass/Fail                |
| 05.229                                     | Front-end Web Development                                                                                                               | 5                 | Pass/Fail                |
| 05.247                                     | Organisation of Databases and Knowledge Bases                                                                                           | 3                 | Exam                     |
| 05.228                                     | Back-end Web Development                                                                                                                | 4                 | Pass/Fail                |
| 05.293                                     | Fundamentals of Data Science                                                                                                            | 5                 | Exam                     |
| 05.123                                     | Developing Web-Applications with REACT                                                                                                  | 5                 | Exam                     |
| 05.238                                     | Game Applications Development                                                                                                           | 4                 | Pass/Fail                |
| 05.304                                     | Object-Oriented Programming in Java                                                                                                     | 5                 | Exam                     |
| 05.202                                     | Computer Networks                                                                                                                       | 5                 | Exam                     |
| 05.237                                     | Developing Apps for Mobile Devices                                                                                                      | 4                 | Pass/Fail                |
| 05.233                                     | Software Testing                                                                                                                        | 3                 | Pass/Fail                |
| 05.281                                     | Cryptographic Information Protection                                                                                                    | 3                 | Exam                     |
| 08.282                                     | IT Project Management                                                                                                                   | 5                 | Exam                     |
| 08.284                                     | Collaborative Project Development Technologies                                                                                          | 3                 | Exam                     |
| 05.266                                     | Creating a REST API with ASP.NET Core                                                                                                   | 4                 | Pass/Fail                |
| 05.124                                     | Developing and Publishing Web-Services and Web-Applications                                                                             | 3                 | Exam                     |
| 30.102                                     | Course paper                                                                                                                            | 3                 | Pass/Fail                |
|                                            | <b>Total</b>                                                                                                                            | <b>121</b>        |                          |

| <b>1.3. Practical training</b>                |                                                                             |            |           |
|-----------------------------------------------|-----------------------------------------------------------------------------|------------|-----------|
| 31.182                                        | Educational internship in "Programming Basics"                              | 3          | Pass/Fail |
| 31.183                                        | Educational internship in "C # Programming"                                 | 3          | Pass/Fail |
| 31.105                                        | Work experience internship                                                  | 6          | Pass/Fail |
| 31.179                                        | Professional-Oriented Work Experience Practice                              | 6          | Pass/Fail |
| 32.103                                        | Qualifying paper                                                            | 6          | Pass/Fail |
|                                               | Total                                                                       | <b>24</b>  |           |
| The total amount of compulsory components 177 |                                                                             |            |           |
| <b>II. Elective Components of the EPP</b>     |                                                                             |            |           |
| <b>2.1. General training cycle</b>            |                                                                             |            |           |
|                                               | Theoretical Training in Basic Military Preparation* / Academic Discipline 1 | 3          | Pass/Fail |
|                                               | Academic discipline 2                                                       | 5          | Pass/Fail |
|                                               | Academic discipline 3                                                       | 5          | Pass/Fail |
|                                               | Academic discipline 4                                                       | 5          | Pass/Fail |
|                                               | Academic discipline 5                                                       | 5          | Pass/Fail |
|                                               | Total                                                                       | <b>23</b>  |           |
| <b>2.2. Professional Training Cycle</b>       |                                                                             |            |           |
|                                               | Academic discipline 6                                                       | 5          | Pass/Fail |
|                                               | Academic discipline 7                                                       | 5          | Pass/Fail |
|                                               | Academic discipline 8                                                       | 5          | Pass/Fail |
|                                               | Academic discipline 9                                                       | 5          | Pass/Fail |
|                                               | Academic discipline 10                                                      | 5          | Pass/Fail |
|                                               | Academic discipline 11                                                      | 5          | Pass/Fail |
|                                               | Academic discipline 12                                                      | 5          | Pass/Fail |
|                                               | Academic discipline 13                                                      | 5          | Pass/Fail |
|                                               | Total                                                                       | 40         |           |
| The total amount of elective components:      |                                                                             | 63         |           |
| <b>The total amount of EPP:</b>               |                                                                             | <b>240</b> |           |

\* This academic discipline is mandatory for inclusion in the individual study plans of higher education students in accordance with Part Four of Article 10 of the Law of Ukraine 'On Military Duty and Military Service' and is elective for other students.

## 2.2. Programme Structure and Logic



### 3. Forms of Assessment of Higher Education Students

The qualifying assessment for the educational-professional programme 'Computer Science' in the speciality of 'F3 Computer Science' is conducted by an examination committee. This assessment takes the form of a defence of a qualifying paper. Upon successful completion, graduates receive a state-recognised document awarding them a Bachelor's degree with the qualification of 'Bachelor of Computer Science.'

The qualification paper should involve theoretical, systems-engineering, or experimental research on a complex, specialised assignment or practical problem in the field of computer science, characterised by the complexity and uncertainty of conditions, and requiring the implementation of information technology theories and methods. The qualifying work/project must not contain academic plagiarism, falsification, or fabrication. The qualifying paper must be published in the repository of the higher education institution in which it was submitted.

Qualifying assessment is conducted openly and publicly.



| 5. Матриця відповідності програмних результатів навчання (ПРН) відповідним компонентам освітньої програми |     |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |
|-----------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
|                                                                                                           | ПР1 | ПР2 | ПР3 | ПР4 | ПР5 | ПР6 | ПР7 | ПР8 | ПР9 | ПР10 | ПР11 | ПР12 | ПР13 | ПР14 | ПР15 | ПР16 | ПР17 | ПР18 | ПР19 | ПР20 |
| 10.301                                                                                                    |     |     |     |     |     |     |     |     |     |      | +    |      |      |      |      |      |      |      |      |      |
| 07.101                                                                                                    | +   |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |
| 09.101                                                                                                    | +   |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      | +    |
| 10.320                                                                                                    | +   |     |     |     |     |     |     |     |     |      | +    |      |      |      |      |      |      |      |      |      |
| 13.112                                                                                                    | +   |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |
| 26.172                                                                                                    | +   |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |
| 05.101                                                                                                    |     | +   |     | +   |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |
| 10.302                                                                                                    |     |     |     |     |     |     |     | +   |     |      | +    |      |      |      |      |      |      |      |      |      |
| 01.112                                                                                                    | +   | +   | +   |     |     | +   |     |     |     |      |      |      |      |      |      |      |      |      |      |      |
| 01.122                                                                                                    | +   |     | +   | +   | +   |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |
| 05.265                                                                                                    |     |     | +   |     | +   |     | +   |     | +   | +    |      |      |      |      |      |      |      |      |      |      |
| 05.203                                                                                                    |     | +   |     |     | +   |     | +   | +   | +   |      |      |      |      |      |      |      |      |      |      |      |
| 01.103                                                                                                    | +   | +   | +   |     |     | +   |     | +   |     |      |      |      |      |      |      |      |      |      |      |      |
| 05.230                                                                                                    |     |     |     |     | +   |     | +   |     | +   | +    |      |      |      |      |      | +    |      |      |      |      |
| 05.234                                                                                                    | +   | +   | +   |     | +   | +   | +   |     |     |      |      |      |      |      |      |      |      |      |      |      |
| 01.113                                                                                                    | +   | +   | +   |     |     | +   |     |     |     |      |      |      |      |      |      |      |      |      |      |      |
| 05.235                                                                                                    |     |     |     |     | +   |     |     | +   |     |      |      |      |      |      |      |      |      |      |      |      |
| 05.229                                                                                                    |     |     |     | +   |     |     |     |     | +   |      |      |      |      |      |      |      |      | +    |      |      |
| 05.247                                                                                                    |     |     | +   |     |     |     |     |     | +   |      |      |      | +    |      |      |      |      |      |      |      |
| 05.228                                                                                                    |     |     |     | +   |     |     |     |     | +   | +    |      |      |      |      |      |      |      | +    |      |      |
| 05.293                                                                                                    | +   | +   | +   | +   | +   |     | +   | +   |     |      |      | +    |      |      |      |      |      |      |      |      |
| 05.123                                                                                                    |     |     |     |     |     |     |     |     | +   | +    |      |      |      | +    |      |      |      |      |      |      |
| 05.238                                                                                                    |     |     |     |     |     |     |     |     | +   |      |      |      |      |      |      |      |      |      |      |      |
| 05.304                                                                                                    | +   |     |     | +   |     |     |     |     | +   | +    |      |      |      | +    |      |      |      | +    |      |      |
| 05.202                                                                                                    |     |     |     |     |     |     |     |     | +   | +    | +    |      |      |      |      |      |      |      |      |      |
| 05.237                                                                                                    |     |     |     |     | +   |     | +   | +   | +   | +    |      |      |      |      |      |      | +    |      |      |      |
| 05.233                                                                                                    |     |     |     |     | +   |     | +   |     | +   |      | +    |      |      |      |      |      |      |      |      |      |
| 05.281                                                                                                    |     |     |     |     |     |     |     |     | +   |      |      | +    | +    |      |      |      |      |      |      |      |
| 08.282                                                                                                    |     |     |     |     |     |     |     |     |     |      | +    |      |      |      |      |      |      |      | +    | +    |
| 08.284                                                                                                    |     |     |     |     |     |     |     | +   | +   | +    | +    |      |      | +    | +    |      |      |      | +    |      |
| 05.266                                                                                                    |     |     |     |     |     | +   |     |     | +   |      |      |      |      |      | +    |      | +    |      |      |      |
| 05.124                                                                                                    |     |     |     | +   |     |     |     |     | +   | +    | +    | +    | +    | +    | +    | +    | +    | +    |      |      |
| 30.102                                                                                                    | +   |     | +   |     | +   |     | +   |     |     | +    | +    |      | +    | +    |      |      |      |      |      |      |
| 31.182                                                                                                    | +   |     |     |     | +   |     | +   |     | +   |      |      |      |      |      |      |      |      |      |      |      |
| 31.183                                                                                                    | +   |     |     |     | +   |     | +   |     | +   |      |      |      |      |      |      |      |      |      |      |      |
| 31.105                                                                                                    | +   |     |     |     | +   |     | +   |     | +   | +    |      |      | +    | +    |      |      |      |      |      | +    |
| 31.179                                                                                                    | +   |     |     |     | +   |     | +   |     | +   |      |      | +    |      |      |      | +    |      |      |      | +    |
| 32.103                                                                                                    | +   |     |     |     | +   |     |     | +   | +   | +    | +    | +    | +    | +    |      |      |      |      |      | +    |

