



**Syllabus of the academic discipline
«FUNDAMENTALS OF ALGORYTHMIZATION AND
PROGRAMMING IN ELEKTRONICS»**

Educational-professional programs:

«Electronic systems»

«Electronic technologies of the Internet of Things»


«Computerized Means of Monitoring Tools of Frequency Resource»

Specialty: 171 Electronics

Field of knowledge: 17 Electronics and telecommunications

Higher education level	Bachelor
Discipline status	Academic discipline of the professional component of Educational
Course	1 (first)
Semester	odd, even
The scope of discipline, ECTS credits / hours	12 credits/360 hours
Teaching language	Ukrainian, English
What will be studied (subject of study)	This discipline is the theoretical basis of the set of knowledge and skills that form the system profile of a specialist in the field of programming.
Why it is interesting /necessary to study (goal)	The purpose of teaching the discipline is to reveal modern scientific concepts, methods and technologies; formation of the student's algorithmic thinking and understanding of the logic of processes; skills to solve typical scientific and engineering problems with the help of modern software, which is a fundamental basis for a specialist in the field of electronics and telecommunications.
What can be learned (learning outcomes)	<ul style="list-style-type: none"> - to gain knowledge related to the process of program development, in particular, including the relationship between the problem and the algorithm for its solution, between the algorithm and program code; - learn the basic provisions of C++ / C# programming languages; - to acquire practical skills of finding the right solutions for creating and debugging programs in C++ / C# languages.
How can you use the acquired knowledge and skills (competences)	<p>The knowledge and skills acquired by the student during the study of this discipline allow</p> <ul style="list-style-type: none"> - independently use the tools of design and research in the process of program development. - independently develop algorithms and programs using high-level algorithmic languages and debug them.

Educational logistics	<p>Course content: Number systems. Arithmetic operations in different number systems. Encoding negative numbers. Fundamentals of Boolean algebra. Algorithms, basic concepts. Modern programming systems. The concept of programming styles. Tools for creating programs in C++. Basic concepts of C++ language. Dynamic data distribution. Arrays. Functions. Structures and classes. General information about C# language and .NET platform. Basic data types, variables. Basic manipulations with strings. Functions and arrays in C#. Structures in C#.</p> <p>Activities: Lectures, laboratory work, computational and graphic work, modular tests.</p> <p>Teaching methods: Educational research based on storytelling, discussion, computer modeling, laboratory work and online work.</p>
Prerequisites	<p>General and professional knowledge that students acquire in the study of such disciplines as: "Higher Mathematics", "Physics" and others.</p>
Requisites	<p>There is a basis for such disciplines as: "Fundamentals of mathematical modeling of processes in electronic devices", "Fundamentals of automated design of electronic circuits" and others.</p>
Information support from the repository and fund of NTB NAU	<p>http://er.nau.edu.ua/ http://www.lib.nau.edu.ua/main/ntb@nau.edu.ua</p>
Location and logistics	<p>Classes are held in a specialized classroom equipped with computer and projection equipment. Students are provided with programs.</p>
Semester testing and examination methodology	<p>Checking measures for the discipline are carried out in the form of:</p> <p>current check - the teacher's definition of knowledge based on the work performed by the student, including independent, tests and other tasks, with scoring according to the criteria and assessment scale approved by the department;</p> <p>intermediate checking - diagnostics of the level of mastery of educational material within the meaningful module;</p> <p>final checking (exam) - diagnostics of the level of mastery of educational material within the entire academic discipline with an assessment of the results on the national scale and the ECTS scale;</p> <p>The form of the exam is determined by the relevant decision of the department and can be based both on the traditional survey system for exam tickets, and on the basis of an interview.</p>
Department	<p>Electronics, robotics, monitoring and IoT technologies</p>
Faculty	<p>Aeronavigation, electronics and telecommunications (FAET)</p>

Teacher 	Full Name: Bidnyi Mykola Semenovich Position: senior teacher Teacher profile: http://kafelec.nau.edu.ua/sklad_bidnuy-ukr.html Tel.: +380936708425 E-mail: nick@nau.edu.ua ; bms4u@ukr.net Workplace: 3.409
Originality of academic discipline	Author's course; teaching in English or Ukrainian (at the request of students)
Link to discipline	http://kafelec.nau.edu.ua

Developer

Mykola Bidnyi

Head of the Department

Volodymyr Shutko