




Syllabus of the academic discipline
«FUNDAMENTALS OF DIGITAL SYSTEMS»
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	2 (second)
Semester	odd
The scope of discipline, ECTS credits / hours	5 credits/150 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 profile of a specialist in the field of electronics of information systems and technologies
Why it is interesting /necessary to study (goal)	The purpose of teaching the discipline is to reveal modern scientific concepts, concepts, methods and technologies of forming students' knowledge necessary to understand the principle of operation and design of digital electronic devices used in electronic systems, as well as to acquire practical skills in digital circuit research.
What can be learned (learning outcomes)	<ul style="list-style-type: none"> - study of the main directions of development of digital circuitry, mastering the knowledge about the purpose and principle of operation of elements and components of digital devices. - mastering the means of synthesis of combinational circuits and digital automata. - acquisition of skills of experimental research of typical units of digital
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 digital design and research tools; - independently develop single- and multi-output combinational digital circuits and circuits with memory.

Educational logistics	<p>Course content: The structure and principle of operation of digital systems. Number recording systems and rules for performing arithmetic operations. Fundamentals of the theory of logic circuits. Switching (Boolean) functions and means of their representation. Minimization of switching functions. Combined digital devices. Synthesis of combinational circuits with many outputs. Arithmetic and logic devices. Elementary automata. Flip-flops. Registers. Pulse counters.</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> <p>Forms of training: group, individual, frontal, collective, classroom and extracurricular.</p>
Prerequisites	<p>"Higher Mathematics", "Physics", "Fundamentals of Semiconductor Materials and Devices", "Theory of Electrical Circuits", "Fundamentals of Analog Electronics.</p>
Requisites	<p>There is a basis for such disciplines as: "Electronic systems", "Basics of electronic circuits design process", "Professional technological practice", "Pre-diploma practice". Mastering the principles of building digital measuring instruments will be useful when performing bachelor's and master's work.</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>Training sessions are held in a specialized classroom equipped with computer and projection equipment. Students are provided with electronic teaching aids, laboratory practice, programs, laboratory digital equipment.</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 (test) - 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 test 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>

<p>Teacher</p> 	<p>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</p>
<p>Originality of academic discipline</p>	<p>Author's course; teaching in English or Ukrainian (at the request of students)</p>
<p>Link to discipline</p>	<p>http://kafelec.nau.edu.ua</p>

Developer

Mykola Bidnyi

Head of the Department

Volodymyr Shutko