Syllabus Form of Academic Discipline

№	Field name	Detailed content, comments
1.	Name of the faculty	Faculty of Information Radio Technologies and Technical Information Security Faculty of Automatics and Computerized Technologies Faculty of Infocommunications Faculty of Electronic and Biomedical Engineering
2.	The level of higher education	Bachelor's
3.	Code and title of specialty	172 – Telecommunications and Radio Engineering
4.	The type and title of the educational program	Educational Program of Radio Engineering
5.	Code and title of the discipline	Designing devices on microcontrollers and FPGAs. FPGA
6.	Number of ECTS credits	4
7.	The structure of the course (distribution by type and hours of training)	4 ECTS credits: 12 h. – 6 lecture, 36 h. – 9 laboratory works, 8 h. – 4 consultations, 64 h. – independent work, type of control: exam.
8.	Schedule (terms) of study of the subject	3 Course, 6 semester of study (2 Course, 4 semester of study for a shortened form of study)
9.	Prerequisites for learning the discipline	Disciplines that must be studied before: Higher Mathematics, Programming, Basics of Circuitry, Designing devices on microcontrollers and FPGAs. Modeling of digital signals by means of MATLAB and VHDL, Designing devices on microcontrollers and FPGAs. Microcontrollers
10.	Abstract (content) of the discipline	Mandatory discipline of basic (professional) training, contains the following content modules: Basics of VHDL language. Description of digital system in VHDL language. Description of devices in VHDL language. Programming of modern FPGA Artix 7 manufactured by Xilinx in VHDL language. Study of methods and means of debugging and simulation of projects using Xilinx Vivado CAD.
11.	Competencies, knowledge, skills, understanding that a higher education acquirer has in the learning process	- ability to perform computer modeling of devices, systems and processes using universal application packages; - ability to use systems of modeling and automation of circuit design for development of elements, nodes, parts and blocks of radio engineering and telecommunication systems; - ability to apply knowledge in the field of informatics and modern information technologies, computer and microprocessor technology and programming, software for solving specialized and practical problems in the field of professional activity.
12.	Learning outcomes of a Higher Education applicant	- to solve at the hardware and software level the task of building specialized hardware; - create models of digital systems at different levels of description: abstract, schematic and software; - to master the methods of decomposition of the system, which are implemented in hardware and software; - implement a description of logic (program) of medium complexity in VHDL;

		- to develop embedded microprocessor systems based on FPGA.
13.	Assessment system in accordance with each task for taking tests/exams	To get a positive grade in the discipline PPMP.PLIS students must know the basics of programming systems for digital systems in HDL, the basics of synthesis and analysis of logic circuits, FPGA circuitry Artix-7, be able to write programs of medium complexity in VHDL, know methods and tools for debugging Vivado CAD software. Students must complete and defend laboratory work. The credit is assessed by a rating, which is defined as the number of points obtained by the student during the semester on a 100-point scale.
14.	The quality of the educational process	Adherence to the principles of academic integrity (http://lib.nure.ua/plagiat). Update of the work program of the discipline - 2020. The laboratory workshop is equipped with modern laboratory layouts Nexys 4 DDR Artix-7 FPGA Trainer Board and uses modern software: MatLab, Vivado Design Suite from Xilinx.
15.	Methodological support	Complex of educational and methodical support of educational discipline «Designing devices on microcontrollers and FPGAs. Modeling of digital signals by means of MATLAB and VHDL. Microcontrollers. FPGA» for students of all forms of specialties: 125 – «Cybersecurity» (STPI), 151 – «Automation and computer-integrated technologies», 152 – «Metrology and Information-Measuring Technique», 163 – «Biomedical Engineering», 171 – «Electronics», 172 – «Telecommunications and radio engineering», 173 – «Avionics» / [Electronic resource] Authors.: I. Svyd, I. Obod, O.Vorgul, L. Saikivska, O. Zubkov. – Kharkiv, 2020. – 380 p. http://catalogue.nure.ua/knmz. 2. Methodical instructions to laboratory works on discipline «Designing devices on microcontrollers and FPGAs.FPGA» for students of all forms of specialties: 125 – «Cybersecurity» (STPI), 151 – «Automation and computer-integrated technologies», 152 – «Metrology and Information-Measuring Technique», 163 – «Biomedical Engineering», 171 – «Electronics», 172 – «Telecommunications and radio engineering», 173 – «Avionics» / [Electronic resource] Authors.: I. Svyd, I. Obod, O.Vorgul, L. Saikivska, O. Zubkov. – Kharkiv: NURE, 2020. – 95 c. – pdf 2,1 Mb.
16.	The developer of the Syllabus	Svyd Iryna, Head of Department of MTS, Candidate of Technical Sciences, Associate Professor iryna.svyd@nure.ua Obod Ivan, Professor the Department of Microprocessor Technologies and Systems, Doctor of Technical Sciences, Professor ivan.obod@nure.ua Vorgul Oleksander, Assosiate Professor of the Department of MTS, Candidate of Technical Sciences, Associate Professor oleksandr.vorgul@nure.ua Zubkov Oleh, Assosiate Professor of the Department of MTS, Candidate of Technical Sciences, Associate Professor oleh.zubkov@nure.ua Saikivska Liliia, Assosiate Professor of the Department of MTS, Candidate of Technical Sciences, Associate Professor liliia.saikivska@nure.ua

Note.

The Syllabus is a document explaining the mutual responsibility of the teacher and the student. It presents procedures (including deadlines and evaluation principles), policies (including academic integrity policies) and the content of the discipline, as well as a calendar for its implementation. The measured goals that the teacher sets before his discipline should be stated in the Syllabus. The student must understand what he/she will be able to learn, what this course may be useful for. The Syllabus outlines the conceptual transition from "knowledge acquisition" and "practical skills" to competencies that a student can learn while studying this course. The Syllabus includes the course summary, purpose (competences), list of themes, reading materials, rules for passing missed classes. Unlike the work program and the educational and methodological complex of the discipline, The Syllabus is created for the student.