Syllabus Form of Academic Discipline

№	Field name	Detailed content, comments
1.	Name of the faculty	Faculty of Electronic and Biomedical Engineering
2.	The level of higher education	Bachelor's
3.	Code and title of specialty	152 – Metrology and Information-Measuring Technique
4.	The type and title of the educational program	Educational Program Engineering of Optoinformational and Laser Systems
5.	Code and title of the discipline	_____ Designing devices on microcontrollers and FPGAs. Microcontrollers
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, 5 semester of study (2 Course, 3 semester of study for a shortened form of study)
9.	Prerequisites for learning the discipline	Disciplines that must be studied before: Higher Mathematics, Informatics, Fundamentals of Electrical Engineering and Electronics, Designing devices on microcontrollers and FPGAs. Modeling of digital signals by means of MATLAB and VHDL
10.	Abstract (content) of the discipline	Mandatory discipline of basic (professional) training, contains the following content modules: Modern STM32 microcontrollers and basics of C language. ARM programming of STM32 processors. Built-in and external peripheral programming.
11.	Competencies, knowledge, skills, understanding that a higher education acquirer has in the learning process	- ability to use modern engineering and mathematical packages to create models of instruments and measurement systems; - ability to create software products in different programming languages or modern specialized software.
12.	Learning outcomes of a Higher Education applicant	- develop schematics and write software for such devices as: keyboard controller, PWM and analog signal generator, analog date meter digital signal filtering device, UART communication device, graphic display control device, etc .; - debug software using simulation packages STM32CubeMX and IAR Embedded Workbench for ARM; - program the microprocessor.
13.	Assessment system in accordance with each task for taking tests/exams	To get a positive grade from PPMP. Microcontrollers, students must master three main sections of this course: modern STM32 microcontrollers and the basics of the C language, ARM programming of STM32 processors, programming of embedded and external peripherals. 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 STM32F4 DISCOVERY and uses modern software: MatLab, STM32CubeMX, IAR Embedded Workbench for ARM v 8.3 Kikxart X.
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. Microcontrollers» 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. – 88 c. – pdf 2,4 Mb.
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