

Syllabus of Academic Discipline
“ Measurement methods and tools ”

№	Field name	Detailed content, comments
1	Name of the faculty	FACULTY OF INFOCOMMUNICATIONS
2	The level of higher education	Bachelor's educational and scientific
3	Code and title of specialty	152 – Metrology and Information-Measuring Technology
4	The type and title of the educational program	Educational program – Technical Expertise
5	Code and title of the discipline	
6	Number of ECTS credits	12
7	The structure of the course (distribution by type and hours of training)	72h.– 36 L, 36h.– 18 P, 36h.– 18 L, 24h.–12 consultation, 192h.– independence, type of control: exam
8	Schedule (terms) of study of the subject	IV year, VI-VII semester
9	Prerequisites for learning the discipline	Previously, the disciplines “Higher mathematics” and “Physics” should be studied
10	Abstract (content) of the discipline	Normative discipline of basic (professional) studying in the specialty, contains 2 parts with the following content modules: Part 1 1. Classification and main characteristics of analog measuring devices 2. Electromechanical measuring devices. 3. Methods and instruments of measuring voltage and current. 4. Methods and instruments of measuring the parameters of electric circuits with concentrated constants. 5. Devices for observing and studying the shape and parameters of signals. 6. Methods and instruments of frequency measurement. Part 2 1. Classification and main characteristics of digital measuring devices. 2. Peculiarities of the structural schemes of the Center for Economic and Social Development. 3. Digital measuring instruments comparison. 4. Digital measuring devices of tracking balancing. 5. Digital measuring devices of unfolding balancing. 6. Digital measuring devices with preliminary conversion.
11	Competencies, knowledge, skills, understanding that a higher education acquirer has in the learning process	Know the basic principles of construction and operation of analog and digital measuring equipment, methods and types of conversion of measured values and signals, methods of

		<p>automation of measurements, principles of using modern microelectronic element base and computing devices;</p> <p>Develop and analyze the structure of analog and digital measuring devices, substantiate requirements for their nodes, calculate errors, competently operate analog and digital measuring devices.</p> <p>To use modern methods of design and metrological analysis of analog and digital measuring equipment.</p>
12	Learning outcomes of a Higher Education applicant	<p>Ability to perform error analysis of digital and analog measuring devices.</p> <p>Ability to design and explore virtual instrumentation in the Electronics WorkBench environment.</p> <p>Be able to choose an element base for the implementation of a measuring device or its functional node.</p>
13	Assessment system in accordance with each task for taking tests/exams	<p>To evaluate the student's work during the semester, the final rating grade is calculated as the sum of grades for various classes and control measures.</p> <p>Lb No. 1,2,3 (6...10)×3 = 18...30 points Control work 1 - 9...15 points Control point 1 - 27...45 points Lb No. 4.5 (6...10)×2 = 12...20 points Control work 2 - 9...15 points Control work 3 - 12...20 points Control point 2 - 33...55 points A total of 60...100 points per semester The form of final control is a written (combined) exam.</p> <p>With this type of control, the final score Pf is calculated according to the formula: $P_f = 0.6 \cdot P_{sem} + 0.4 \cdot P_{ex}$ where Psem is the grade for the semester in the 100-point system, Rex is the grade for the exam in the 100-point system.</p> <p>The exam ticket consists of two theoretical questions and a task. Each theoretical question is valued at 30 points, and the problem at 40 points (in total - 100 points).</p>
14	The quality of the educational process	<p>Adherence to the principles of academic integrity (http://lib.nure.ua/plagiat). Update the work program of the discipline – 2022 year.</p>
15	Methodological support	<p>Complex of educational and methodical support of the educational discipline “ Measurement methods and tools ” for the bachelor of a specialty 152 "Metrology and information-measuring technology", educational program "Technical expertise" [Electronic resource] / KhNURE; Compiler: Y.Kozlov. - Kharkiv, 2017. http://catalogue.nure.ua/knmz.</p>

16	The developer of the Syllabus	Y.Kozlov, Department of Information and Measurement Technology, PhD E-mail: yurii.kozlov@nure.ua
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