

Syllabus of the discipline Physics  
for students of the first (bachelor's) level of higher education  
specialty 125 Cybersecurity  
educational and professional program Security of information and  
communication systems

1	Name of the faculty	Faculty of Computer Engineering and Control
2	Level of higher education	bachelor
3	Code and name of the specialty	<u>125.Кибербезпека</u>
4	Type and name of educational program	Security of information and communication systems
5	Code and name of the discipline	Physics
6	Number of ECTS credits	<u>6</u>
7	Discipline structure (distribution by types and hours of study)	180 hours, of which: lectures 40 years, practical 12 years, laboratory 20 years, consultations 28 years, independent work 80 years.
8	The schedule of studying the discipline	1 course, 1 semester
9	Prerequisites for studying the discipline	Knowledge of the main sections of higher mathematics, including linear and vector algebra, differential and integral calculus.
10	Discipline abstract	<p>Content module 1. Classical mechanics.</p> <p>Theme 1. Kinematics.</p> <p>Theme 2. Dynamics</p> <p>Theme 3. Laws of conservation.</p> <p>Content module 2. Classical electrodynamics.</p> <p>Theme 4. Electric field.</p> <p>Theme 5. Direct current.</p> <p>Theme 6. Magnetic field.</p> <p>Theme 7. Electromagnetic field.</p> <p>Content module 3. Electromagnetic oscillations and waves.</p> <p>Theme 8. Electromagnetic oscillations.</p> <p>Theme 9. Alternating current.</p> <p>Theme 10. Electromagnetic waves.</p> <p>Content module 4. Optics</p> <p>Theme 11. Wave optics</p> <p>Theme 12. Quantum optics</p>

11	Competences, knowledge, skills, understanding, which is acquired by the applicant in higher education in the learning process	<p><b>Competences that provide the study of the discipline:</b>          Epistemological approach to the study of natural phenomena and technology development.          Knowledge of the fundamental laws of physics and the ability to apply them in practice.          Understanding the concepts of basic physical quantities, determining their content, means and units of measurement.          Ability to work with scientific equipment and measuring instruments, process and analyze the results of scientific research</p>																								
12	Learning outcomes of higher education	<p><b>The study of this discipline gives the student opportunities.</b>  <u>Know:</u> basic physical laws and concepts, the essence of various phenomena and methods of their description, the relationship of physical quantities and their units, methods of research and processing of their results, the application of physical laws and phenomena in modern computer technology.  <u>Be able to:</u> analyze natural phenomena and technical processes, apply physical laws to implement practical knowledge, use modern equipment to prove experimental research and computer processing of the results.</p>																								
13	Assessment system according to each task for passing the exam	<p>To evaluate the work of students during the semester, the rating assessment of the calculation by the formula:  <math>Q_{fin} = 0,6 * Q_{sem} + 0,4 * Q_{ex}</math> , where <math>Q_{sem}</math> – grade for the semester, <math>Q_{ex}</math> – score for the exam on a 100-point scale          The final grade is translated into national and ECTS according to the scale:</p> <table border="1" data-bbox="647 1480 1533 1872"> <thead> <tr> <th>Grade from the discipline</th> <th>Score on a national scale</th> <th>ECTS scale score</th> </tr> </thead> <tbody> <tr> <td>96-100</td> <td>5 (perfectly)</td> <td>A</td> </tr> <tr> <td>90-95</td> <td>5 (perfectly)</td> <td>B</td> </tr> <tr> <td>75-89</td> <td>4 (good)</td> <td>C</td> </tr> <tr> <td>66-74</td> <td>3 (satisfactorily)</td> <td>D</td> </tr> <tr> <td>60-65</td> <td>3 (satisfactorily)</td> <td>E</td> </tr> <tr> <td>35-59</td> <td>2 (unsatisfactorily)</td> <td>FX</td> </tr> <tr> <td>1-34</td> <td>2 (unsatisfactorily)</td> <td>F</td> </tr> </tbody> </table>	Grade from the discipline	Score on a national scale	ECTS scale score	96-100	5 (perfectly)	A	90-95	5 (perfectly)	B	75-89	4 (good)	C	66-74	3 (satisfactorily)	D	60-65	3 (satisfactorily)	E	35-59	2 (unsatisfactorily)	FX	1-34	2 (unsatisfactorily)	F
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14	The quality of the educational process	<p><u>Adherence to academic integrity by teachers, in particular:</u>  references to sources of information in the case of use of information, compliance with copyright law, providing reliable scientific and methodological activities, monitoring the observance of academic integrity by applicants for higher education.</p> <p><u>Observance of academic integrity by applicants for higher education, in particular:</u>  independent performance of educational tasks, references to sources of information in case of use of information; providing reliable information about the results of their own educational activities.</p>
15	Methodical support	<p><b>Basic literature</b></p> <ol style="list-style-type: none"> <li>1. General physics with examples and problems. Part 1. Mechanics. Molecular physics and thermodynamics: textbook. manual / V.O. Storozhenko and others. - Kharkiv: SMIT Company LLC, 2006 - 320p.</li> <li>2. General physics with examples and problems. Part 2. Electricity and magnetism: textbook. manual / IM Kibets and others. - Kharkiv: SMIT Company LLC, 2012 - 232p.</li> <li>3. General physics with examples and problems. Part 3. Optics: textbook. manual / I.M. Kibets and others. - Kharkiv: SMITH Company LLC, 2009 - 424p.</li> <li>4. Synopsis of lectures on physics for bachelors in the field of "Cybersecurity" (Electronic edition) / emphasis. V.O. Storozhenko– Kharkiv: KNURE, 2019 –160p.</li> </ol> <p><b>Supporting literature</b></p> <ol style="list-style-type: none"> <li>1. Collection of tests in the course of physics / O.M. Kovalenko and others. - Kharkiv: KNURE, 2006, - 124p.</li> </ol> <p>Methodical instructions for different types of classes</p> <ol style="list-style-type: none"> <li>1. Methodical instructions for software in physics (Part 1) / Edited by: V.O. Storozhenko and others. - Kharkiv: KNURE, 2013 - 152p.</li> <li>2. Methodical instructions for software in physics (Part 2) / Edited by: V.O. Storozhenko and others. - Kharkiv: KNURE, 2013 - 140p.</li> <li>3. Methodical instructions for laboratory work in physics. Part 1. Mechanics and molecular physics / O. V. Vyshnivetsky and others. - Kharkiv: KNURE, 2009– 84p.</li> <li>4. Methodical instructions for laboratory work in physics. Part 2. Electricity and magnetism / O. M. Kovalenko and others. - Kharkiv: KhNURE, 2006– 96p.</li> </ol>

16	Syllabus developer	Professor of the Department of Physics Volodymyr Oleksandrovyh Storozhenko volodymyr.storozhenko@nure.ua
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