SYLLABUS

in the discipline "Physics"

for students of the first (bachelor's) level of higher education specialty 151 Automation and computer-integrated technologies educational and professional program Automation and computer-integrated technologies, System engineering.

| 1. Name of the faculty 2. Higher education level 3. Code and name of the specialty 4. Type and name of deducational program 5. Code and name of the discipline 6. Number of ECTS credits 7. Structure of the discipline (distribution by types and hours of study) 8. Schedule of study of the discipline 9. Prerequisites for studying the discipline 10. Discipline abstract 10. Discipline abstract 10. Discipline abstract 10. Content module 1. Classical mechanics. 10. Topic 1. Kinematics. 10. Topic 6. Special theory of relativity. 10. Topic 1. Surcture of the discipline of the discipline discipline discipline 10. Discipline abstract | | | | |
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| Type and name of the specialty | 1. | Name of the faculty | Faculty of Automatics and Computerized Technologies | |
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| 9. Prerequisites for studying the discipline Knowledge of the beginning of mathematical analysis (integral and differential computation), analytical geometry and linear algebra (actions with vectors), chemistry (atomic-molecular theory, structure of atoms and molecules). Content module 1. Classical mechanics. Topic 1. Kinematics. Topic 2. Dynamics of translational motion. Topic 3. Work and energy. Topic 4. Dynamics of rotational motion. Content module 2. Mechanical oscillations. Special theory of relativity. Molecular physics and thermodynamics. Topic 5. Mechanical oscillations. Topic 6. Special theory of relativity. Topic 7. Molecular physics. Topic 8. Thermodynamics. Content module 3. Electrostatics. Electrodynamics. Topic 10. Electric field in vacuum. Topic 10. Electric field in dielectrics. Topic 11. Conductors in an electric field. Topic 12. Direct electric current. Content module 4. Magnetism. Electromagnetic oscillations and waves. Topic 13. Magnetic field in vacuum Topic 14. Electromagnetic induction. Topic 15. The magnetic field in matter. Topic 16. Electromagnetic field. Topic 17. Electromagnetic field in matter. Topic 18. Elastic waves Topic 19. Electromagnetic waves Content module 5. Optics. Elements of quantum mechanics. Topic 20. Wave optics Topic 21. Quantum optics. Topic 22. Bohr's theory of the structure of the hydrogen atom. | 8. | | | |
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| | | Topic 24. Schrödinger's equation and its application. |
| | | Content module 6. Quantum theory of the structure of atoms and |
| | | molecules. Solid state physics. |
| | | Topic 25. Quantum theory of the structure of the hydrogen atom. |
| | | Topic 26. The structure of many electron atoms. |
| | | Topic 27. Structure of molecules and molecular spectra. |
| | | Topic 28. Quantum statistics. |
| | | Topic 29. Zone theory. |
| | | Topic 30. Contact phenomena. |
| 11. | Competences, knowledge, | Competence, which provides the study of the discipline: |
| | skills, understanding, which | Ability to abstract thinking, analysis |
| | is acquired by the applicant | Ability to apply knowledge in practical situations |
| | of higher education in the | Ability to model physical phenomena, perform theoretical and experimental |
| | process of learning | studies. |
| | | Ability to learn independently, to master new knowledge |
| | | Ability to work with scientific equipment and measuring instruments, |
| | | process and analyze the results of scientific research |
| 12. | Learning outcomes of | The study of this discipline gives the student the opportunity to: |
| 12. | | |
| | higher education | know: basic concepts, laws and theories that explain physical phenomena, |
| | | as well as physical quantities by which to describe physical phenomena and |
| | | processes; the essence of physical phenomena, their mechanisms, causal |
| | | relationships in physical processes; limits of application of physical laws |
| | | and theories of physics; theoretical and experimental methods of physical |
| | | research; physical principles of operation of modern technological |
| | | equipment and apparatus; purpose and possibilities of application of the |
| | | experimental equipment for carrying out physical research. |
| | | be able to: analyze the relationship of physical phenomena of different |
| | | nature; apply physical knowledge to solve practical problems that arise |
| | | during the development and operation of modern technology; to analyze the |
| | | |
| | | influence of physical phenomena on the modes of operation of modern |
| | | technology; plan and conduct the simplest physical experiments using |
| | | modern equipment and process the results of these experiments; highlight |
| | | specific physical content in the applied problems of the future specialty |
| | | <u>have</u> : the ability to conduct experimental research with modern methods |
| | | and process their results, the ability to apply basic knowledge of physics to |
| | | the extent necessary to provide engineering training in the chosen |
| | | profession. |
| | | <u>r</u> |
| | | |
| | | |
| 13. | Assessment system for each | |
| | task for passing the test / | |
| | exam | For assessment the student's work during the semester, the final rating |
| | | O_{sem} is calculated as the sum of grades for different types of classes and |
| | | ***** |
| | | control activities, which include practical classes, laboratory work, |
| | | individual calculation task and modular testing. |
| | | |
| | | The combined exam is used as a form of final control for the discipline |
| | | "Physics". With this type of control, the final grade P_n is calculated by the |
| | | |
| | | formula: $P_n = 0, 6 \cdot O_{sem} + 0, 4 \cdot O_{ex}$, where O_{sem} - grade for the semester in |
| | | |
| | | a 100-point system, O_{ex} - grade for the exam in a 100-point system. |
| | | The final grade P_n is translated into national and ECTS according to |
| | | the scale: |
| | | the soule. |
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| Assessment in the discipline | | | | 1 | 1 |
|---|-----|---------------------|--|---|---|
| 14. The quality of the educational process 15. | | | | | |
| 14. The quality of the educational process 15. | | | 96-100 | 5 (excellent) | A |
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| 14. The quality of the educational process 2 (unsatisfactory) E 35.59 2 (unsatisfactory) FX FX 1-34 2 (unsatisfactory) FX | | | | | |
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| 35-59 2 (unsatisfactory) FX FX FX FX FX FX FX F | | | | | |
| 14. The quality of the educational process 15. Methodical support 16. Methodical support 17. Zagalna fizyka z prykladamy i zadachamy. Chastyna 1. Mehanika. Molekuljarna fizyka ta termodynamika: navch. Posibnyk/ V.O. Storozhenko ta in Harkiv: TOV «Kompanija SMIT», 2006. – 320 s. 2. Zagalna fizyka z prykladamy i zadachamy. Chastyna 2. Elektryka ta magnetyzm: navch. posibnyk / I.M. Kibec' ta in Harkiv: «Kompanija SMIT», 2009 – 424s.; 3. Zagalna fizyka z prykladamy i zadachamy. Chastyna 3, t.1. Optyka: navch.posibnyk / I.M. Kibec' ta in H.:Kompanija SMIT, 2012. – 232s. 4. Zagalna fizyka z prykladamy i zadachamy. Chastyna 3, t.2. Kvantova ta atomna fizyka. Fizyka tverdogo tila. Jaderna fizyka: navch.posibnyk / I.M. Kibec' ta in H.:Kompanija SMIT, 2013.–304s 18. Additional literature: 1. Elementarnaja fyzyka v prymerah y zadachah: ucheb. Posobye dlja podgotovytel'nih otdelenyj/ A.D. Tevjashev y dr Har'kov: HNURE, 2005 628s. 2. Zbirnyk testiv z kursu fizyky/ O.M. Kovalenko ta in Harkiv: HNURE, 2006124s. 3. Slovnyk fizychnyh terminiv: navchdovidkovyj posibnyk/ T.B. Tkachenko- Harkiv: HNURE, 200480s. 4. Savel'ev Y.V.Kurs fyzyky. T.1,2,3M.:Nauka, 1989. 18. Methodical instructions to take up views: 1. Metodychni vkazivky do PZ z fizyky (chastyna 1)/Uporjad.: V.O.Storozhenko ta in Harkiv: HNURE, 2013152s. 2. Metodychni vkazivky do PZ z fizyky (chastyna2)/Uporjad.: V.O.Storozhenko ta in Harkiv: HNURE, 2013140s. 3. Metodychni vkazivky do laboratornyh robit z fizyky. Chastyna 1. Mehanika ta molekuljarna fizyka. / Uporjad.: O.V. Vyshnivec'kyj ta in Harkiv: HNURE, 2009. – 84s. 4. Metodychni vkazivky do laboratornyh robit z fizyky. Chastyna 2. Elektryka i magnetyzm. / Uporjad.: R. P. Orel ta in Harkiv: HNURE, 201815 HNURE, 201 | | | 35-59 | , , | FX |
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