



STRUCTURING EDUCATIONAL MATERIALS IN PHYSICS EDUCATION

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Physics is one of the fundamental sciences, shaped as a solution to the needs of human society and continuing to evolve over time. Considering the vast amount of physical knowledge accumulated through years of theoretical and experimental research, in order for learners to effectively master physics, it is essential first to define their age category, level of knowledge acquisition, and the relevance of physics to their chosen future specialty.

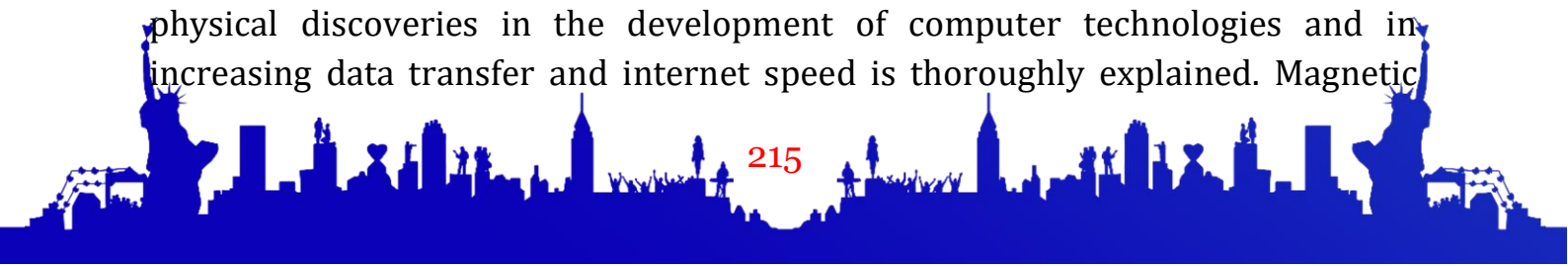
In physics teaching, the correct selection of educational materials according to the level of instruction and class division ensures that learners comprehend new concepts more easily and retain them in memory for a longer time.

In the “New Uzbekistan,” significant attention is being paid to the development of all sciences, including physics. This is evidenced by Presidential Decree No. PQ-5032 dated March 19, 2021, “On Measures to Improve the Quality of Education and Develop Scientific Research in the Field of Physics.” As physics develops, new fields emerge—such as nanophysics and picophysics—studying systems at extremely small scales, which have applications not only in science and technology but also in the medical field.

In higher education institutions, physics is taught to first- and second-year students across all disciplines with 4–6 credits. Based on the degree of relevance between the field and physics, the subject is delivered according to a specially structured curriculum.

For example, in teaching the **biophysics module** to first-year medical students, the selected physics content is drawn from both physics and medical contexts. Explaining the physical properties of electromagnetic waves helps future healthcare professionals understand their diagnostic and therapeutic applications. For instance, an **electrocardiograph (ECG)** device operates based on electromagnetic waves and is one of the most reliable and cost-effective tools for obtaining information about the human heart.

For students in **applied mathematics and informatics**, physics education emphasizes the **integration of physics and computer science**. The role of physical discoveries in the development of computer technologies and in increasing data transfer and internet speed is thoroughly explained. Magnetic





materials used in computer technology perform various functions, such as hard and floppy disk data storage, magnetic tapes, and magnetic stripes on credit cards. The operational memory of a computer can also be stored via magnetic cores. **Magneto-optical recording** is explained through the use of magnetic fields and lasers.

As in all subjects, physics education is organized based on didactic principles. To ensure effective results, teachers present subject-specific materials in a progressively challenging sequence appropriate to learners' cognitive levels.

References:

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