TEACHING PHYSICS ON THE BASIS OF INTEGRATION OF ARCHITECTURE AND BUILDING SCIENCES

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Annotation. The article provides instructions on how to teach physics in construction universities. It is emphasized that in the process of presenting theoretical materials, more attention should be paid to the practical application of some of the concepts studied and the topic is covered with specific examples.

Key words: physics, builders, engineers, methodology, physical knowledge, construction, vibration.

Introduction. It is well known that the teaching of physics in higher education institutions requires the teaching of specialties. Most of the disciplines taught in construction universities are based on physical concepts, laws and phenomena. Therefore, a successful systematic structure of teaching physics in construction universities will help students to understand the role of physics in the system of scientific knowledge, as well as the importance of the student's chosen specialty and prepare him for future success in science.

Taking into account the main requirements for the organization and conduct of physics lessons for students of construction universities [1], we identified the following main methodological aspects in the implementation of the practical direction of teaching physics to overcome the difficulties:

Presentations should be made from the perspective of modern applied physics, that is, to demonstrate the main directions of the application of physical knowledge in future professional activities and to provide them with a sufficient number of examples of their practical application [2]. Practical examples should be clear to students. In the process of presenting the theoretical material, more attention should be paid to the practical application of some of the concepts studied. For example, “Forced oscillations. Resonance Phenomena” focuses on the vibrations of construction and other engineering structures. A detailed presentation of this report can be organized in the following order [3].

The basic concepts of the subject are defined — *vibrations, forced vibrations, resonance.* A differential model of the oscillation system is considered and mathematical expressions for resonant frequency and amplitude are found. The beneficial and harmful effects of vibration and resonance can be mentioned. However, we will discuss in more detail the use of vibrations in construction technologies.

Vibrating piles are used to lay the foundations of buildings and special attention should be paid to its physics. It is known that piles are usually placed on the ground with a heavy load, but now it is possible to do this with the help of vibrations. At the top of the pile is an oscillator, which generates vibrations in the pile. As a result, the frictional force of the ground and the pile is sharply reduced and absorbed under the influence of gravity.

The sinking speed is 3-4 meters per minute. The piles can also be removed from the ground using this vibrating method. Based on the same details, we need to consider the harmful effects of vibrations on construction sites and ways to combat them [4]. Here are three main reasons for harmful vibrations:

1. Oscillations under the influence of periodic motive forces. These include vibrations caused by indoor engines.

2. Spontaneous oscillations (auto oscillations). It is known that these oscillations occur under the influence of any constant energy source, which can lead to the destruction of structures. This can be caused by constant winds on power lines, TV towers or suspension bridges.

3. Vibrations caused by the action of one or more forces, such as explosions or earthquakes.

The report should pay special attention to ways to combat these vibrations. There are two ways to do this.

1. By resonance tuning. It is used to create any structures that have or may have harmful vibrations.

2. Vibration attenuation. This method is common, where the scheme of the vibration attenuation device, its structure and the principle of operation are considered. The teaching experience shows that the report under consideration will be very popular with future civil engineers [5]. There are many such examples in each area of construction in teaching students.

In conclusion, the effective work of a civil engineer in the age of modern technology involves increasing the level of teaching physics, which in turn allows the use of physical and mathematical methods to create technical models of practical engineering problems and solve them by developing logical thinking.

Therefore, the peculiarity of the professional training of students of construction specialties is not only the acquisition of new knowledge in physics, but also the increase in the need to use the acquired physical knowledge in their future careers through the proper organization.

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