

THE PECULIARITIES OF STUDYING THE COURSE "ENGINEERING GRAPHICS" BY STUDENTS MAJORING IN "CHEMICAL TECHNOLOGY AND ENGINEERING"

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The current state of development of industry, science, and technology makes high demands on the training of highly qualified specialists with a sufficient level of technical training. An important place in this training is given to the course "Engineering Graphics". The aim of the discipline "Engineering Graphics" is to develop students' spatial imagination, ability to analyze and synthesize spatial forms, develop skills for reading and performing technical drawings, construction of drawings using computer technology.

According to the requirements of the educational and professional program, students must know:

- principles of construction of geometric images on the plane;
- principles of construction of sections and lines of intersection of different surfaces;
- principles of construction of sweeps of surfaces of technical designs;
- rules for creating working drawings in accordance with the Unified System of Design Documents;
- a method of creating working drawings and visual images using the graphic computer program "Autocad".

Students start studying "Engineering Graphics" from the first semester of the first year when they are not yet adapted to study in higher educational institutions. In addition, the study lasts only one semester (4 credits). Therefore, within the existing restrictions on the number of hours and the number of tasks, the EG course itself and its teaching methods were modernized.

The educational process in the discipline is implemented in various types of educational work: lectures, practical classes, independent work of students. All training materials: syllabus, textbooks, manuals, tasks for independent work, examples of graphic works, tasks for preparation for test control, questions for self-preparation are posted on the MS Teams platform in the study group. Students have free access to them.

Since the lecture course on "Engineering Graphics" is accompanied by complex graphical constructions that require a certain logical sequence and clarity of operations of algorithms for solving metric and positional problems, multimedia technologies are used to present educational material. They allow students to transfer part of the discipline in a more accessible, visual form using step-by-step execution of drawings, animations, and color effects. This contributes to a better memorization of educational material, the development of logic and spatial imagination of students. Students have free access to all lecture materials (presentations) and can view them as needed at any time.

Students perform a number of practical works.

1. Construction of the projection of geometric bodies. Determining the position of points on the surfaces of geometric bodies.

2. Construction of axonometric projection.
3. Construction of sections, cross-sections.
4. Working drawing of detail with a thread.
5. Working drawing of the part type "Shaft".
6. Working drawing of the part type "Corpus".
7. Working drawing "Cover".
8. Electrical circuits.
9. Introduction to the graphic computer program "Autocad".

Each student is given an individual task. Instructions for practical work contain an algorithm and a sample of its implementation. There is also a term of work defense, which allows students to plan their time.

Since a lot of time is devoted to independent work, you need control and timely assistance from the teacher. Therefore, students can get advice and, if necessary, discuss the educational problem, using a variety of advances in Internet technology: chats, video calls with a demonstration of screens, e-mail, etc.

A special place is given to knowledge control. After studying each topic, students take a test. Two modular tests include both test and detailed questions and graphical tasks.