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FEATURES OF STUDYING ENGINEERING GRAPHICS

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Annotation: Engineering graphics is a branch of geometry that studies methods for depicting spatial shapes in a drawing and algorithms for solving positional, metric, and constructive problems. The main purpose of studying engineering graphics is for students to acquire the knowledge and skills necessary to execute and read drawings, compile design documentation, and make sketches of structures and parts. Tasks for comparing objects, images, and concepts are widely used in psychological research, as well as in teaching logic. In this case, the support goes to the analysis of the basis for comparison.

Keywords: comparing topics, complex problems, engineering graphics

Then the process of identifying the common and different in two or more phenomena, processes, etc. is assumed. Due to the specifics of the Engineering Graphics discipline, the comparison is visual and graphical. It makes sense to compare only "homogeneous" objects. Therefore, the teacher carefully evaluates and justifies the uniformity of themes or graphic works. The act of comparison consists in comparing objects in order to identify their relationships. Comparison involves the discovery of commonalities that can only be identified by a comparative method, which helps to establish differences in the objects being compared.

We use this approach as a basis for comparing drawings. If we consider that in comparison there are: the object being compared (the object of comparison), the object with which the comparison takes place (the means of comparison), and their common feature (the basis of comparison), then for example, comparing two drawings simultaneously "Sketch" and "Technical drawing", we get the following: "sketch" (the object of comparison) is an image of an object according to the rules of rectangular projection, observing the proportions between the parts of the depicted object to the eye, a "technical drawing" (a means of comparison) is an image made by hand, according to the rules of axonometry, observing the proportions to the eye. The basis for comparing topics is part of the definition of concepts. In this case, it is "an image made by hand and by eye, with respect to proportions." The difference in these concepts is that a "sketch" is an image of an object in three forms, according to the rules of rectangular projection, and a "technical drawing" is an image of an object in axonometry, followed by hatching.

At the present stage, when the engineering corps is faced with a global task - to move from catching up with the development of technology to advancing, and technical universities are faced with the task of training "non-serial" engineers with an expanded set of competencies, a new wave of interest in the problem of interdisciplinary communication is rising. Solving most of the complex problems of our time, non-trivial scientific and industrial tasks requires knowledge of frontier sciences. The integration of scientific knowledge leads to the need for an integrative approach to the educational process, to multidisciplinary learning, to the specialist's ability to apply knowledge in areas related to his specialty, and the ability to comprehensively apply them in solving scientific and industrial tasks. The model of the modern educational process can be represented as a hypertext, the fragments of which are the units of the educational process - the studied disciplines. To teach students how to navigate the knowledge

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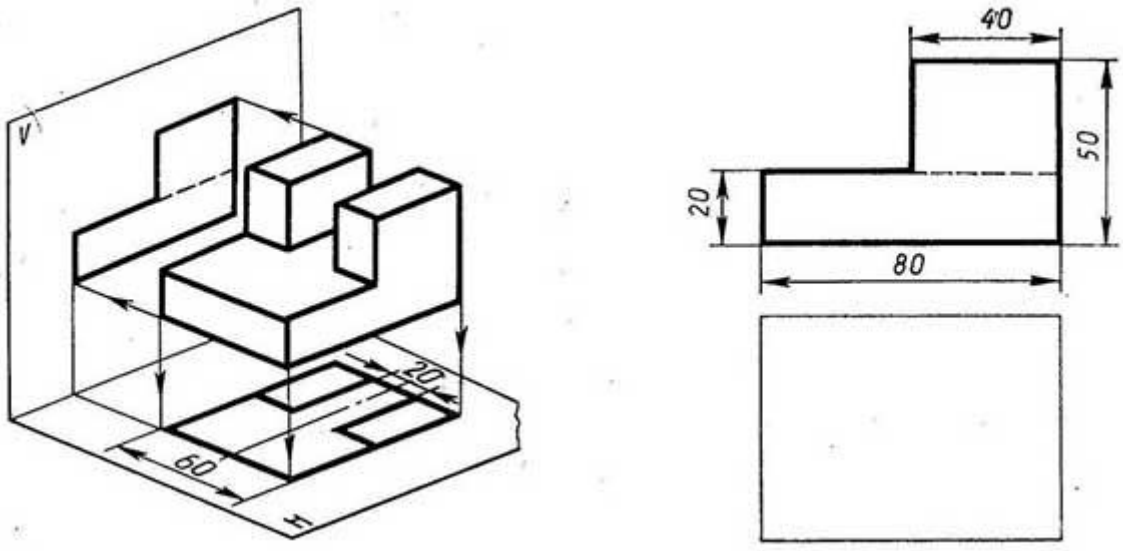
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field, how to transfer knowledge both within the blocks of the fundamental engineering base, and in the creative solution of production tasks, to the transition from knowledge management to knowledge generation is the task facing the latest cognitive pedagogical technologies. One of the most relevant means of an integrative approach to learning is the use of interdisciplinary communication opportunities.

The role of image visualization plays a big role in our lives.In ancient times, there were numerous drawings and hieroglyphs on stones, in caves and rocks, on various objects and weapons. For some time now, the production of any model begins with the execution of its outline or sketch, which allows you to determine not only the shape and size of all parts of the object, but also to get a visual representation of it. The first techniques from the techniques of displaying objects were created over many centuries. They were performed in a way that was scientifically justified only at the end of the 18th century by the founder of descriptive geometry, the scientist G. Monge. In our country, the first standards containing the order of execution of engineering drawings were published in the 30s of the 19th century and were constantly subject to corrections and additions. Currently, all technical projects are carried out according to the rules defined by a set of state standards called the unified system of design documentation, hereinafter referred to as ESCD. Following these instructions can be a guide to action for all businesses and engineers. A drawing drawn up according to the rules and regulations should be understandable to any design engineer, a technically "savvy" performer, regardless of the country in which he lives. A drawing is an international idea of transmitting graphic information and a means of expressing the designer's ideas, and the main production document used to make assemblies, mechanisms, devices and their components. A drawing image of a body consists of two or more interconnected images made according to the rules of rectangular projection, in compliance with the rules and conventions set out in the standards.



The technical discipline engineering graphics trains and forms the important skill of a future engineer to express a production and design idea through drawings, electrical circuits and other types of design documents. An important prerequisite for the successful study of graphics is a solid knowledge of theory. Studying does not mean formally memorizing standards, but understanding their meaning, correctly interpreting the wishes, requirements and recommendations contained in them. The main task assigned to the designer is to lay the foundations and develop three–dimensional and spatial geometric thinking - the ability of a

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person necessary for design, design and technological activities. Creative work is unthinkable without knowledge of the rules connecting a spatial shape and its flat image. This is not the least reason for the role of engineering graphics in the formation of a future specialist - the discipline is the theoretical basis for mastering techniques and subsequent general professional and special knowledge. If we look at it on a large scale, engineering graphics consists of two main sections: the basic foundations of descriptive geometry and machine-building drawing. Descriptive geometry studies the ways of constructing images on a plane and methods of solving geometric problems on these images.

Engineering graphics also provides a theoretical basis for studying other general engineering disciplines: copromat, theory of mechanisms and machines and machine parts, design and engineering work in accordance with current state standards, specifications and other regulatory documents.

This subject is a discipline that studies the ways of transmitting information using design documents, they include information about the device of a technical thing. The design document contains technical information about the composition, mutual arrangement, connection of parts and elements of the object, and the types of material from which these parts are made. The success of a design engineer's work in the future is determined not only by knowledge and experience, but also by the level of professional qualities. For an engineer, this means technical literacy, a creative approach to the task being performed, developed spatial thinking, the ability to quickly coordinate their work using ESCD, possess computer technology, and a willingness to constantly improve themselves.

The second reason why it is difficult for students to study engineering graphics is the lack of imagination. The power of imagination varies from student to student, and it takes time to improve. But difficult doesn't always mean impossible. Students can overcome this difficulty through practice, i.e. solving more tasks and a greater variety of them. By developing the power of imagination, students can easily understand the shape and orientation of an object in space. As in everyday life, language is important to convey a message or explain your point of view to someone. Studying engineering graphics will help you explain the three-dimensional features of an object. If you are an engineering student, you are a future engineer who will have to deal with many three-dimensional shapes in his career. So, to explain the three-dimensional features of an object to others, you need to thoroughly study engineering graphics. In addition, as an engineer in the future, you will need to prepare drawings during the design process to better transfer technology and knowledge.

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