K. Lysiuk, Master student
I. Remesnyk, Master student
H. Raikovska, PhD in Ped., Prof., research advisor
A. Danylchenko, Lecturer, language advisor
Zhytomyr State Technological University

ENGINEERING TRAINING OF THE PROFESSIONAL MACHINE-BUILDING

Nowadays the question concerning the professional training of engineering and technical specialists, namely, "Do I need engineering training in technical higher education institutions?" is raised. This issue is relevant not only for technical institutions of higher education, but also for the enterprises of the machine-building industry.

The quality of higher technical education and the competitiveness of young professionals in the modern economy depend on the solution of such issues as staffing in the domestic industry with qualified engineers and technicians, interaction of higher education institutions (HEI) and enterprises in the field of engineering and technical cooperation, the necessity to improve the qualification of teachers of engineering and technical disciplines, the development of material and technical base of HEI.

The future product concept creating is the most important and complex stage, in which the transition from awareness or setting up the need for some products to its conceptual model is provided. Engineering accelerates the development of mechanical engineering, provides opportunities to stay in the modern market, where new goods and services win. Computer engineering enables the acceleration of the advent of innovation.

The age of drawings has rather seen its day. The rate around the world is bet on digital technology, in particular computer systems CAD and CAE.The first one is responsible for constructing and design, the second one is responsible for calculations and engineering analysis. If earlier the process of designing a new model could involve hundreds of people, now the problem can be solved by one person.

The key concept of system engineering design is the Product Life Cycle (PLC). The life cycle of the industrial products consists of a series of stages, starting with the appearance of the new product idea before being disposed of after the expiration date of its exploitation.

Therefore, modern technologies of virtual engineering offer new approaches to both the design and the production activity. They allow to evaluate the possibility of manufacturing various design options (including assessment of the quality of assemblage or performance of projected products); to optimize the production process (by the digital imitation method); to customize the product to customer requirements easily; to accumulate a wide knowledge base effectively; to provide a basis for the collaborative project development.

The main components of virtual production are a virtual design, a digital imitation, a virtual prototyping, and a virtual factory. Virtual design provides the ability to create and modify its components, to manage different devices and interact with

virtual objects in the virtual environment. The designer can see the stereoscopic image of virtual objects and hear spatial realistic sound.

In order to reduce the time-consuming and costs of the product development, the team of developers constantly needs to optimize their design concepts. After all, using only 2D or 3D concepts when creating a product is less effective than their interaction.

For certain types of designs, 2D-shredding models are more effective, because they provide a "level of critical information" quickly; make it easy to implement big, unpredictable changes, since there is no need to take into account the structure and created dependencies; 3D usually requires a preliminary elaboration of the structure and connections. Organization of 3D CAD-modeling throughout the entire enterprise allows the involvement of a large circle of workers in the development process, providing users with the choice of the modeling method.

It should also be mentioned that the current stage of development of CAD software is characterized by a constant expansion of system functionality. The more complex software is used, the higher the qualification requirements of specialists working with these programs are.

Due to the dissemination of the "heavy" CAD, the staffing problem in enterprises is exacerbated, because the maintenance of highly skilled professionals who have skills in working with systems does not cost the enterprise dearly; the dependence of teams on such specialists is formed. Therefore, it is difficult to find qualified specialists, to provide the employment that requires special skills and abilities.