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## **DESIGN TRAINING OF SPECIALISTS IN THE FIELD OF "INDUSTRIAL ENGINEERING"**

Today it is difficult to imagine any sphere of human activity that the designer would not touch. The process of the implementation of the design education in Ukraine depends on the circumstances of the development of the highly developed machine-building industry. In this regard, higher educational technical institutions (Mechanical Engineering Institute of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Ukrainian National Forestry University, National University of Life and Environmental Sciences of Ukraine, Zhytomyr State Technological University and others) began to prepare bachelors, masters and doctors of philosophy in the sphere of knowledge 13 "Mechanical engineering"- "Engineering design", "Computer-aided design". As claimed by Boychuk O., Orlova N., Sidorchuk L., Ryzhova I., etc. in their researches, the art of design is one of the driving factors of social changes and carries a significant potential of transformations of the economic and cultural spheres of human life.

There is a myth that industrial engineering is a specialty provided knowledge how to design a machine, but actually it is a possibility to obtain the best technical education and become a skilled engineer. Industrial engineering is a specialty of a wide profile, which allows the future specialist to understand the components of large industrial production, to understand the structure of any machine tools, industrial systems and even planes and spacecraft; know how to provide innovative computer technologies at work, to operate all special software and develop brand-new approaches to the industry optimization.

Machine parts and knots are made according to the drawings, on the basis of the projects i.e. the set of calculations, graphic materials and explanations, assign for argumentation and determination of construction parameters (kinematic, dynamic, geometric, etc.), its productivity, economic efficiency. In case of particularly responsible constructions, the project is complemented by a layout or an operating model.

In all areas of design and engineering, much attention is paid not only to the aesthetic, technical, functional characteristics, but also to the ergonomics of equipment. The most general tendency is the aspiration of designers from different countries to use the most laconic forms of machine-building equipment. This phenomenon is not accidental, it is caused by a number of factors and not only by the fashion movement as it is sometimes interpreted. First of all, it is caused by the desire to optimize the "human - machine" relations.

Therefore, the designers are facing a lot of fundamental questions put by the shaping of metalworking machines. It should be noted that the design of machines is a creative process with the inherent laws of construction and development. The main features of this process are the multivariety of the decisions, the necessity of coordinating the decisions with the general and specific requirements of the constructions, as well as with the requirements of the relevant standards regulating the terms, definitions, conventions, measuring system, methods of calculation etc.

Studying the questions of ergonomics and ergonomic design, the acquisition of techniques of incorporating the human factor into designing the environment, equipment, etc. will provide the training of highly skilled professionals who can not only evaluate, but also create products that will ensure high quality and efficiency of work, health and safety of people who will use the equipment or stay in the projected environment.

Complex technical sciences such as design and ergonomics in machine building differ from the classical ones. They study and describe at least three types of objects: 1) “human- machine” systems (computers, control panels, semiautomatic devices, etc. 2) complex technosystems (engineering constructions, planes and technical systems for their maintenance, airfields, roads, service equipment etc. 3) such objects as technology or technosphere.

Through creative activity, design and ergonomic research based on scientific knowledge and technical inventions new operating principles, ways of their implementation, construction of technical systems or their components are created. For successful development of the society, it is important to complement science, art and production technologies, especially in training designers for different spheres of human activities.