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## TO THE QUESTION OF GREEN ENGINEERING

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Human society lives in a post-industrial world now. It causes a fundamental changes in politics, economy, culture, labor, in the personal life of each person.[1] And the main driving force of these branches of human society are scientific developments in the field of high technologies. The development of high-tech, in its turn, leads to environmental pollution.

Growing pollution of the environment is a global problem of today that requires an immediate decision. The environment situation needs onew technology introduction that aimed on world ecological statement changing. That is why serious measures of an ecological security system creation should be taken.

Ecological problems are highlighted in a great number of books, articles, and research conferences as a result of human activities. Nowadays, human community is starting to realize some specific goals, for example: minimizing waste, approaching sustainability and increasing recycling. Goal statement gives good opportunity in providing a vision of ecological problems, which need to be attained, and a lot of discussions like this promotes to significant part of that types of vision.

In this way, the first phase of improving the environmental situation is radical restructuring of global education its methods, goals and objectives in accordance with new time.

It is necessary to include in the educational program disciplines which learning and offering a new technology of solving environmental

problems. «Ecology and nature» is one of the educational programs in the direction of preparation experts in ecological sphere. The main goal of this specialization is:

- Preparation of competitive specialists in the field of environment and natural resources;
- development of operations to minimize the negative impact of human activity on the environment;
- opportunity of assessment of anthropogenic influence on the components of the environment as a result of any industrial activity.

Also all engineers and scientists that deal with inventions should remember about ecological responsibility. That is why during study in university future engineers and scientists should get acquaintance with basic principles of green engineering. Green engineering focuses on the ways of achievement sustainability in ecology through technology and science. Green engineering is based on the 12 basic principles. [2]. These principles provide engineers and scientists with a strong base to participate in creation and development of new materials, processes, products and systems that have positive effect on human health and the environment. According to foreign researcher Paul Anastas.[2], there are 12 principles of green engineering:

Principle 1: Designers need to strive to ensure that all material and energy inputs and outputs are as inherently nonhazardous as possible.

Principle 2: It is better to prevent waste than to treat or clean up waste after it is formed.

Principle 3: Separation and purification operations should be designed to minimize energy consumption and materials use.

Principle 4: Products, processes, and systems should be designed to maximize mass, energy, space, and time efficiency.

Principle 5: Products, processes, and systems should be “output pulled” rather than “input pushed” through the use of energy and materials.

Principle 6: Embedded entropy and complexity must be viewed as an investment when making design choices on recycle, reuse, or beneficial disposition.

Principle 7: Targeted durability, not immortality, should be a design goal.

Principle 8: Design for unnecessary capacity or capability (e.g., “one size fits all”) solutions should be considered a design flaw.

Principle 9: Material diversity in multicomponent products should be minimized to promote disassembly and value retention.

Principle 10: Design of products, processes, and systems must include integration and interconnectivity with available energy and materials flows.

Principle 11: Products, processes, and systems should be designed for performance in a commercial “afterlife”.

Principle 12: Material and energy inputs should be renewable rather than depleting.

The breadth of the principles’ adaptability is significant. Green engineering must be effective and appropriate in all types of dealing with design architecture: molecular architecture required to construct chemical compounds, product architecture to create an automobile or urban architecture to build a city. Differently, these would not be principles but simply a list of useful techniques that have been successfully demonstrated under specific conditions.

Global following of Green Engineering principles will lead the humanity to the new step in evolution. The understanding of its basic principles can save the humanity from itself and protect nature for the future generations. Authors believe that it is time to create something really innovative, useful and healing for the Earth.

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## **ДИСЦИПЛИНА «ТВОРЧЕСКИЙ ПРОЕКТ», КАК ОСНОВА ПОДГОТОВКИ КОНКУРЕНТОСПОСОБНОГО ИНЖЕНЕРА**

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У современных выпускников школ, гимназий и лицеев особо остро встает вопрос о дальнейшем обучении и получении качественного образования. Кто-то идет получать средне-специальное образование, кто-то - в армию, кто-то строит семью, но все-таки большин-