

Disciplinary evolution of Sustainable Development in Engineering Education

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Abstract

The aim of this presentation is the program of Sustainable Development /SD/ as discipline for Engineering Education.

This type of course will ensure and create a conditions for perception of scientific and technical achievement by the students not only in narrow local space, but also in wider geographical, global scale.

This program is training especially for the students of the last course in BA level of Chemical technologies and Engineering Ecology Department of SEUA. This students, the future experts in the field of chemical technologies - basic organic synthesis, electrochemical manufactures, manufacture of a glass an silicates, the biotechnology and pharmacy, should be acquaint with the newest ecologically pure technologies, with reorientation on sharp reduction of resources and pollution of an environment. They should understand that with limiting care it is necessary to carry out industrialization.

For todays of Armenian educational system the most important thing is mass and accessible educational technologies and techniques, able to solve the problem of joining the students to social intellectual potential.

Basic contents of a course are reflected in teaching 12 themes. which is described in presentation.

Globalization and development of post industrial countries with his problems result in sharp and fast changes in a society and to occurrence of new principles in definition of tasks of a community.

The main global problem is a sustainable development. The basic making of sustainable development is a environmental protection. The influence of Human amplifies on an environment, anthropogenic factor becomes as principal. At the international level, the developed nations must be prepared to provide help to the Third World if sustainable development is to be successful.

The realization of principles of ecological policy and its program purposes requires the wide and organized actions in the field of the education. The similar approach should provide to the nearest future specialists in wide involving in process of product realization, in creative process of making the new goods and the end prosperity in modern life. The modern approach to sustainable development is increasingly multifaceted, with a need to integrate a wide range of elements. It has become people centred with local strategies being developed to meet local problems, for example, as education.

The urgency of ecological-educational programs is caused by a place of chemical manufactures in modern life. Today commodity nomenclature of chemicals consists more than of thousands. Thus many from received target and collateral substances represent danger for industrial personals, for consumers and in generally for environment.

The aim of this program is training the students of the last course in BA level of Chemical technologies and Engineering ecology Department of SEUA. This type of course will ensure and

create a conditions for perception of scientific and technical achievement by the students not only in narrow local space, but also in wider geographical, global scale. The global scale it is a level of the international community, that is connected to development of the international institutes and documents accepted by them.

The priority of ecological imperative will promote an orientation in a choice of possible directions turning in a major condition socially ecological policy. On the other hand, it is known that if the company or other economical organization invests in knowledge, which increase productivity of investments of the physical or human capital or raises a common level of participation of the businessman, the gain of productivity conducts an achievable due to this to growth of economy as a whole.

The beginning of 21 centuries has shown that the Mankind leaves on a new coil of challenges and uncertainties. The growth of the extreme weather phenomena all over the world precisely testifies. That the change of a climate is not the skeptical forecast and the reality. This call requires resolute measures. The realization of ideas and projects can made at taking into consideration of balance between requirements present and vital prospects of the future. The stability of human development is something greater the continuation of ecological policy by different means. It is strategy of modernization in which to cover huge innovation potential for economy, environment and society.

The students of the Chemical technology and environmental engineering department of SEUA pass some of ecological disciplines: General ecology, Engineering ecology, Microbiology and Microbial growth, Toxicology, Air Pollution and Control, Water quality, Waste water treatment, Solid waste disposal, Monitoring. The students, the future experts in the field of chemical technologies - basic organic synthesis, electrochemical manufactures, manufacture of a glass an sili-

cates, the biotechnology and pharmacy, should be acquaint with the newest ecologically pure technologies, with reorientation on sharp reduction of resources and pollution of an environment. The students should understand that with limiting care it is necessary to carry out industrialization. The criterion of SD is considered such economic attitude to an environment and natural ecosystem that allows keeping them within the limits of economic capacity.

The given course will allow acquainting the future specialists with global problems facing by mankind in the 21-th century. It will present to the students of the tendency of change of an environment on a global scale. Acquaintance with principles of SD will allow the future engineers to take possession of methods of management, scientific, technical and economic levels connected with researches in the field of protection of an environment and feedback, and also with legal-political norms in researched area. A rate propose also acquaintance of the young experts with the circumstance of Republic Armenia before a world public in the field of protection of an environment with organizations of different levels responsible in the sanction of the above mentioned tasks.

The realization of the program on study of a course <Sustainable development> provides with the pedagogical staff having wide experience of activity in social sphere regularly engaged in scientific and pedagogical activity. The lectures of proposed discipline have a scientific degree also.

Effective means for solving the task of SD program has become: science and methods of seminars and conferences, holding discussions, issuing of specialized literature on SD, collections of scientific themes end method developments for ecological, political, economical and low problems. book popularizing science and explaining the surrounding world. For todays of Armenian educational system the most important thing is

mass and accessible educational technologies and techniques, able to solve the problem of joining the students to social intellectual potential.

The basic preparation of the program provides with access of each student to library funds and databases. It is necessary to organize the student's visits in special libraries of the foreign representations in RA, firms, factories. The realization of practical employment at the modern enterprises succeeded in realization of the programs of environmental protection is supposed.

There are supposed also acquaintances of students with the practice work of National Assembly and Constitutional Court of RA, with the practice work of government agencies that are responsible for organization and sanction of questions in sphere of Human development and Environmental protection.

The passage of a course should be accompanied by display of the didactic materials - the pictures, tables, video films, clips and e.c.t..

Basic contents of a course are reflected in teaching the following themes:

1. Global problems of Mankind in beginning of 3-th thousandths.
2. Tendency of change of an environment on a global scale. Extreme weather conditions - the Global warming. The means and the ways of easing anthropogenesis pressure on an environment on a global scale. Greenhouse effect.
3. The methods of struggle with poverty for rescue of ecology on a global scale.
4. The creating a global alliance. The international mutual commitments of Republic of Armenia / RA/ in the field of environmental protection. The integration of tasks of steady development in framework World Trade Organization and International trade.
5. The legal and political norms connected with the sanction of environmental protection.
6. An influence of scientific and technical, economic and administrative questions on environmental protection and feedback of such influence.
7. The state and public organizations connected with the sanction of nature protection tasks. The mobilization of local resources for achievement of Sustainable development /SD/. The ways of a reduction of break for standards of living in advanced and less developed countries.
8. The methods of management and conducting tasks in the field of environmental protection. An acquaintance with themes - " Drinking water", " The restoration of fish reserves", " Poisonous chemicals", " The reduction of a biological variety".
9. The participation of organizers of an industry, engineers and technologists for maintenance of the sanction of questions of environmental protection. The global system monitoring of an environment.
10. The organization and planning of the enterprises with ecologically clean technologies, principles and strategy. An acquaintance with the programs - " Sustainable samples of consumption and manufacture", " Sustainable energy for development", " Sustainable power systems".
11. The study of up-to-date manufactures and technologies in researched area /
12. The basic organic synthesis, electrochemical manufactures, manufactures of a
13. Glasses and silicate, biotechnology, pharmaceuticals/.
14. The competitiveness of ecological clean production in the world market. Change of the structure of manufacture and consumption in view of the ethical factors.