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# ENVIRONMENTAL EDUCATION FOR TECHNICIAN ENGINEERS

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## 1.0 Introduction :

Today there is a growing belief that technology has escaped from human control and is making our lives intolerable. Environmental pollution is assuming dangerous proportions all through the globe and India is not free from this poisonous disease. The main cause of pollution probably lies in the sort of world we have chosen to build for ourselves and in our thoughtless worship of "progress" at any cost. Rapid industrialisation, modernisation and technological advancement though necessary but should also be seen in the context of environmental pollution and control.

Within the ambit of technician education, we can achieve much since our students are people who are at the interface of both our industrial endeavours and environment. They are also the ones who are generally and directly affected by it, often with tragic results. By their own attitudes and performance, they, as a large section of society, will influence with immeasurable outcome for good.

Conferences, seminars & workshops have been held world wide to incorporate Environmental Education in the programme of studies. There has been considerable awareness regarding environmental education in the systems of Technical Education but still more needs to be done for im-

plementing it and making the same as one of the job functions of Technician Engineers.

This paper primarily deals with incorporating Environmental Education in the system of polytechnic education. Considerable qualitative improvements are taking place in the technical education system. An effort is being made through this paper to clearly state the objectives, contents and methodology of incorporating environmental education for its effective implementation in the system.

## 2.0 Objectives Of Including Environmental Education In Diploma Courses :

Technician Engineers are the backbone of industry. They perform important functions - manage the shop-floor, production, repair & maintenance and human safety. In the Indian context, this category of engineers are not trained to deal with problems which are created due to environmental pollution. Infact, there is hardly any one who is given the responsibility of taking care of environmental pollution and control. The scenario of fast developing industrialisation and mix of old & new technological processes, create considerable problems of environmental pollution. This needs the education and training of technician engineer students with the objectives :

- a) to create awareness, to develop attitudes and concern for environmental pollution & control,
- b) to create an awareness regarding individual responsibility for his/her actions in relation to the environment and their immediate and long term effect,
- c) to provide basic knowledge of environment & ecology, broadly covering areas like environmental pollution, pollutants, environmental standards and methods of treatment.

### 3.0 Activities Of Technician Engineers Concerning Environment Pollution And Control :

The following are the main activities of concern to technician engineers as observed during the visits to a number of industrial and field organisations :

a)

Identification of sources causing pollution,

- b) Classification of various pollutants,
- c) Disposal of pollutants and wastes,
- d) Maintenance and up keep of plants and devices used in pollution control,
- e) Take precautionary steps for environmental pollution and its control.

### 4.0 Course Contents :

The authors after studying the recommendations of various seminars & conferences, literature search, discussions with professionals in the field and keeping in view the objectives and activities of diploma holders, propose the following course contents, which are a common core to be included in all branches of engineering and technology :

Sr. No	Contents	Instructional Time in Hours
1.	Introduction to Environment and Ecology in the context of National and International scenario	2 hrs.
2.	Environmental Pollution: Sources; Main types-water, soil, air, noise, radiation; effects of pollution on the environment	6 hrs
3.	Sampling and analysis of: water and waste water pollutants; Air pollutants; solid and soil wastes; noise levels	4 hrs
4.	Quality and standards for: air, water and noise; Legislation-Water Act, Air Act, environmental protection Act in India and abroad	4 hrs
5.	Treatment methods and control: Basic principles: unit operations (Sedimentation, precipitation, filtration, incineration, composting etc.); Unit processes; specific pollutants; waste minimization and recycling	10 hrs.
6.	Process industries & pollution control (deal any 4 important ones)	4 hrs.
7.	Environmental Impact Assessment studies	2 hrs.
	<b>Total.</b>	<b>32 hrs</b>

## PRACTICE & FIELD VISITS

Sr. No	Contents	Instructional Time in Hours
1.	Visit to different process industries, like Pulp and Paper, Tanneries, Fertilisers and Pesticides, Metal Finishing etc. to study environmental problems	8 hrs. (4 industries @ 2 hr/industry)
2.	Visit to water treatment plant, study water treatment methods and major tests being conducted to make water fit for drinking in the laboratory	2 hrs.
3.	Visit to sewerage treatment plant, study treatment methods and major tests being conducted	2 hrs.
4.	Maintenance & upkeep of their own scooters to check air & noise pollution	2 hrs.
5.	Tree plantation, cleaning of surroundings and the institute	2 hrs.

**Note :** Field visits can be arranged depending upon the industries around the polytechnic

### THEORY :

#### 5.0 Strategy For Implementation :

Actual roles assigned to technician education system for environmental education may be taken up by the polytechnics but may vary widely among the different polytechnics. These roles can be incorporated to bring attitudinal change and acquisition of skills in students to handle environmental consequences :

The polytechnics can effectively integrate environmental concepts into the subjects being taught.

The polytechnics may include a separate subject in the diploma courses.

The polytechnics may like to organise entrepreneurial awareness camps of 4 to 5 days in which topics included in the course contents are dealt with.

The polytechnics may like to invite experts from field to deliver extension lectures on various topics included in the course contents.

Treatment of environmental engineering course may not be limited to traditional class room lectures only. Efforts need to be made that each student feels involved in it. The teachers may organise seminars, group discussions, self-study by students and interaction with community to gather information to identify problems and their solution etc.

However, this transformation requires concentrated efforts so that:

- teachers are exposed and trained in various aspects of environmental engineering,
- Proper instructional resources, workbooks, assignments games etc. be developed to impart environmental education,
- a high level of interaction between the polytechnic on the one hand and community and industry on the other is necessary to plan the strategy of imparting this education.

## Conclusion :

It is essential to realise that the component of environmental education in technician education is not an addition to an already crowded curriculum but an inherent and essential for developing the appreciation for the environment on a scientific and technological basis.

Students must learn the environmental education to understand and apply it / in the solutions of environmental problems. The environmental education should not be learnt for merely passing an examination.

Keeping in view the gravity of situation, we have to give considered thought for providing education and practice to technician students in environmental education. Also the polytechnic may have to offer continuing education programmes to working technician engineers.

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