

# GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

## COURSE CURRICULUM

- **Programme Title:** Diploma in Civil Engineering
- **Semester:** I
- **Course Code:** 3300003
- **Course Title:** Environment Conservation and Hazard Management

### 1. RATIONALE

Since last Three decades, Environmental Technology has attracted the interests of educationalists and practitioners at all levels of education throughout the World. The growing concern about the natural resources degradation, air & water pollution, deforestation and other environmental problems has prompted educationalists to introduce a course on Environmental Technology in various technical Curricula. As technicians occupy middle level managerial positions in industries, it is essential that they are provided with right kind of environmental education and training. It is with this aim that a course on "Environmental Technology" is being introduced in Diploma Programme. Energy is an important input in all sectors of country's economy. Standards of living of a country can be directly judged by per capita consumption of energy. Energy sources in general can be broadly categorized as - (i) Conventional sources of energy — like fossil fuels such as coal, oil, gas, atomic and hydroelectric energy and (ii) Non-conventional sources of energy — such as solar, wind, ocean, geothermal, and bio-mass etc In general conventional sources of energy are widely used in our daily life and nearly 92% of our energy requirements are met from such sources only. Unfortunately their availability is not universal i.e. in some countries; they are available in plenty whereas in some other countries they are to a very little extent. On the contrary, the non-conventional sources of energy are available everywhere in abundance and may not be exhausted soon. It is a known fact that resources of conventional fossil fuel in the world in general and our country in particular is limited. The rate at which we are using them, it is likely to be exhausted in near future. As we cannot think of human life without energy, it is, therefore, very essential that non conventional sources of energy be tapped invariably.

### 2. LIST OF COMPETENCIES

The course content should be taught and implemented with the aim to develop different types of skills Leading to the achievement of the following competencies.

- To identify and use natural resources.
- To calculate and decide the effect of Mass demand.
- Apply Laws of Physics, Chemistry, Ecology to Engineering Problems affecting environment and to
- take the corrective action accordingly.

### 3. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE	PA	ESE	PA	100
4	0	0	4	70	30	00	00	

**Legends:** L-Lecture; T – Tutorial/Teacher Guided Student Activity; P - Practical; C – Credit;; ESE - End Semester Examination; PA - Progressive Assessment.

#### 4. DETAILED COURSE CONTENTS

Unit	Major Learning Outcomes	Topics and Sub-topics
<b>Unit – I</b>	Improve knowledge about Environment	<b>Introduction</b> Importance of environment and scope
<b>Unit– II</b>	Correlate the facts learnt with knowledge	<b>Ecological aspects of environment</b> the natural system, biotic and abiotic components of natural system, various processes of natural system, Eco system, food chain & webs and other biological Systems, future ecological prospects of man.
<b>Unit– III</b>	Develop reasoning with cause and effect of human development	<b>Industrial revolution, Global environmental problems</b> Overview of agriculture and trade before industrial revolution, evolution of science, mass production, industrialization, mining, transportation, steam engines, oil exploration, fractional distillation, IC engines, Use of Batteries, DC motors, AC current, AC generators, power plants, Mac Adam roads, mass transportation Mass Production Global Environmental problems
<b>Unit – IV</b>	Forecast and learn from the facts	<b>Environmental pollution</b> Understand causes of environmental pollution, water pollution, air pollution, the Noise as pollutant, radiation, solid waste and its effects on Animals, Vegetation, Land, Human beings and on Industries and the future of economy
<b>Unit – V</b>	Appreciate work to be done to use economically natural resources, forests, water, minerals, food, and energy.	<b>Natural resources</b> Know the natural resources Assess the impact of human population on environment Understand abiotic and biotic resources Appreciate forest as natural resource Recognize the concept of sustainable development Appreciate the importance of management, consumption & conservation of natural resources Understand conventional sources of energy Identify non-conventional (renewable) sources of energy Understand the concept of solar radiation. Use and operate different appliances based on solar radiation Understand the concept of wind energy and its applications like wind mill wind farm etc Understand feasibility of as a source of energy Identify different types of biomass energy plants Apply principles of conservation of energy Understand the concept of energy auditing, energy saving etc Identify newer and newer renewable sources of energy.
<b>Unit – VI</b>	Appreciate and solve problems	<b>Clean Technologies</b> Cleaner Production, Properly Implementation, Principles and Practices, CP verses End Pipe Approach, Benefits, Procedures, Sustainable Development
<b>Unit – VII</b>	Appreciate and solve problems	<b>Fundamentals of seismic engineering</b> Terms, Scale, Measurements, Magnitude, Direction, Occurrence, Effects- at source, Travel Path and on Site, Zoning, attenuation, Hazard Estimation
<b>Unit – VIII</b>	Use pre and post disaster management techniques.	<b>Natural Hazards and Disasters,</b> Classification, Geologic, Atmospheric and Other Natural Hazards, Effects and vulnerability of hazards, Hazard and Risk assessment, Prediction and warning, Frequency, Size and Location

**5. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)**

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks (Duration – .....Hours)			
			R Level	U Level	A Level	Total
1.	Introduction	2	1	1	0	2
2.	Ecological aspects of environment	8	4	3	1	8
3.	Industrial Revolution and global	10	3	3	4	10
4.	Environmental pollution	4	2	1	1	4
5.	Natural resources	15	4	5	6	15
6.	Clean Technologies	5	1	2	2	5
7.	Fundamentals of seismic engineering	8	3	2	3	8
8.	Natural Disasters	3	1	1	1	3
	<b>TOTAL HOURS</b>	<b>56</b>	<b>20</b>	<b>17</b>	<b>19</b>	<b>56</b>

**Legends:**

R = Remembrance; U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)  
Industrial revolution, Global environmental problems

**6. SUGGESTED LIST OF PROPOSED STUDENT ACTIVITIES**

1. Observe night sky for pollution
2. Observe longest day shortest day
3. Observe germination of seeds
4. Observe stale water and its bad odour
5. Observe automobile vehicle and smoke
6. Observe garbage in streets
7. Measure the time garbage has been removed
8. Observe heat generated in closed room and green house effect

**7. SUGGESTED LEARNING RESOURCES****A. List of Books**

Sr. No.	Title of Book	Author	Publication
1.	Environmental Studies	Anandita Basak	Pearson
2.	Environmental Science and Engineering	Alka Debi	University Press
3.	Coping With Natural Hazards, Indian Context	K. S. Valadia	Orient Longman
4.	Engineering and Environment	Edward S. Rubin	Mc Graw Hill Publ.

**B. List of Major Equipment/ Instrument****C. List of Software/Learning Websites**

**mit.edu.**

**8. COURSE CURRICULUM DEVELOPMENT COMMITTEE**

- 1.** Prof. H.L.Purohit , HOD , Civil Engg. Dept. , L.E.College. Morbi
- 2.** Prof. P.A.Pandya, L C E , Civil Engg. Dept, G.P , Himatnagar