3012 - ENVIRONMENTAL ENGINEERING

Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)				
					Theory		Practical Ex.		Total
Lectures	Practical	Credits							
3	-	3		25	3Hrs.	100	-		125

Pre-requisite	Source
Nil	

Semester	Theory	Test	Total	TW	PR	Gr Total

RATIONALE: - This course aims at making the diploma engineering student aware of today's situation and future concerns with respect to understanding and management of the environment.

COURSE CONTENTS	Hrs	Mks
1. ECOLOGY	10	20
Ecosystem –Components: -Land, water, air, flora & fauna; Their interdependence & interconnection; Necessity & importance of environmental protection of renewable & non-renewable resources; Ecology: -Forestation & deforestation, relevance, need to protect, preserve; Forests as sinks of pollution; The pollution problem,		

development & man's activity; Industrialisation, wastes into nature, non-hazardous and hazardous type, biodegradable & non-biodegradable, relevance.
Case studies of problems: -Oil pollution, pesticide problem, polymers (plastics).
Cycles in nature: -Hydrological cycle, carbon cycle, nitrogen cycle.

2. WATER 12 25

Sources of water for human activity: -Surface & underground water. Requirements of wholesome water: - Domestic & industrial need for good quality water.
Consumption of water: -Quality desired for human & industrial activity – Disinfecting, hardness, suspended & dissolved solids and units of measurement.
Water pollution: -Sources and causes of pollution; Effects of contamination; Sewage (or waste water) – Domestic & industrial; Effects of discharging wastewater into environment.
Necessity of treatment of wastewater: -Relevance & effects; Benefits of pollution abatement; Overview of treatment systems: Physical, biological and chemical methods stating examples and use of each. (Detail working of treatment systems not expected); Other theories of pollution abatement: -Reduction of volume at source, recycle.

3. AIR 12 25

Historical overview: - Air pollution as a local as well as a global phenomenon.
Sources of pollutants: -Primary & secondary pollutants, effects of meteorological conditions such as temperature, relative humidity and wind on pollutants behaviour.
Classification of pollutants: -Particulates, hydrocarbons, carbon monoxide, oxides of sulphur, oxides of nitrogen and lead; Indoor air pollution; limits for their presence in ambient air; Effects of pollutants on human health, plants & buildings; Automobile pollution; Overview of treatment systems for air pollution controls: Need to control emissions at source; Physical & chemical techniques for specific pollutants stating examples. (Details of control systems not expected).

4. SOLID WASTE 4 10

Types of solid waste: -Domestic / municipal and industrial types; General constituents of municipal solid waste; Definition of rubbish, garbage and dry refuse.
Necessity of safe disposal; Techniques commonly adopted -Land application, landfill sites, incineration. (Details of planning and working not expected).

5. NOISE 4 10

Sources of noise pollution; Noise measurement and control.
Noise intensity levels –Allowable limits for different situations; Noise control devices.
Effects of noise pollution.

6. GLOBAL ISSUES & LEGISLATION 6 10

Global problems of environment: -General understanding of Greenhouse effect, ozone layer depletion, ocean contamination, acid rain.
Legislation in India: -The Environment (protection) Act, 1986, definitions, general scope; The Pollution Control Boards, central & state level. -

Total 48 100

TERMWORK

1. Assignments are based on chapters - 1,2,3,4,5 and 6
2. Sessional work will also include a short seminar.

REFERENCE / TEXT BOOKS

1. Introduction to Environmental Engineering and Science by Gilbert M. Masters, Prentice –Hall (1995)
2. Environmental Pollution Control Engineering by C. S. D. Rao
3. Pollution Control in Process Industries by S. P. Mahajan
4. Water Supply & Sanitary Engineering (Environmental Engg.) by S.C. Rangawala
5. Air Pollution by M.N. Rao & H.V.N. Rao.