University of Mumbai			
CLASS: T.E. (Electronics & Telecommunication Engineering)		**Semester - V**	
SUBJECT: Environmental Studies			
Periods per week (each of 60 min.)	Lecture	2	
	Practical	-	
	Tutorial	1*	
		Hours	Marks
Evaluation System	Theory Examination	2	50
	Practical examination	-	-
	Oral Examination	-	-
	Term Work	-	25
	Total		75
* Class wise Tutorial			

Module	Contents	Hours
Objective	**Objective of this course is to create environmental awareness, of variety of environmental concerns.**	-
1	The multidisciplinary nature of environmental studies: Definition, Scope and importance Need for public awareness	**01**
2	Natural Resources Renewable and non- renewable resources Natural resources and associated problems a) Forest resources: use and over-exploitation, deforestation, case studies, timber extraction, mining, dams and their effects on forests and tribal people. b) Water resources: use and over utilization of surfaces and ground water, floods drought, conflicts over water, dams-benefits and problems. c) Mineral resources: use and exploitation, environmental effects of extracting and using mineral sources, case studies. d) Food resources: World food problems overgrazing, effects of modern agriculture, fertilizers-pesticides problems, Water logging, salinity, case studies. e) Energy resources: Growing energy needs, Renewable and non- renewable sources,	**04**

	use of alternate energy sources, case studies f) Land resources: Land as a resource, Land degradation, man induced landslides, soil erosion and desertification • Role of an individual in conservation of natural resources. Equitable use resources for sustainable lifestyles	
3	• Ecosystems • Concepts of ecosystems • Structure and function of an ecosystem • Producers, consumers and decomposers • Energy flow in ecosystems • Ecological succession • Food chains, food web and ecological pyramids • Introduction, types, characteristics features, structure and function of following ecosystems a. Forest ecosystems b. Grassland ecosystems c. Desert ecosystems d. Aquatic ecosystems(ponds, streams, lakes, rivers, oceans, estuaries)	**03**
4	Biodiversity and its conservation • Introduction- definition: genetic species and ecosystem diversity • Bio-geographical classification of India • Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values • Biodiversity at global, national, local level • India as a mega diversity nation • Hot spots of bio diversity • Threats to biodiversity: habitat loss, poaching of wild life, man wild life conflicts • Endangered and endemic species of India • Conservation of bio-diversity: In-situ and Ex-situ conservation of biodiversity	**04**
5	Environmental Pollution Definition- • Causes, effects and control measures of:- a. Air pollution b. Water pollution c. Soil pollution d. marine pollution	**04**

	e. Noise pollution f. Thermal pollution g. Nuclear hazards • Solid waste management: Causes, effect and control measures of urban and industrial wastes • Role of an individual in prevention of pollution • Pollution case studies • Disaster management: floods, earthquake, cyclone and land slides.	
6	Social Issues and environment • From unsustainable to sustainable development. • Urban problems related to energy • Water conservation rain water, harvesting, water-shed management. • Resettlement and rehabilitation of people, its problem and concerns case studies. • Environmental ethics, issues and possible solution • Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust case studies. • Waste-land reclamation • Consumerism and waste product • Environmental protection act • Air(prevention and control of pollution) act • Water (prevention and control of pollution) act • Wide-life protection act. • Forest conservation act. • Issues involved in enforcement of environmental legislation. • Public awareness	**04**
7	Human population and the environment • Population growth variation among nations • Population explosion-family welfare program • Environment and human health	**04**

	• Human rights • Value education • HIV/AIDS • Women and child welfare • Role of information technology in environment and human health • Case studies	
8	**Understanding existence and co-existence:** Interrelation and cyclicity between material order, bio-order, animal-order and human-order. **Understanding the human conduct:** Relationship in family, justice in relationship, relationship of human with nature(environment), human behavior, human values, nature and morality **Understanding the human society:** Dimensions of humans Endeavor and objectives, inter-relationship in society, mutual fulfillment and cyclicity in nature.	**06**

Theory Examination:

1. Question paper will be comprising of total 7 questions, each of 10 marks.
2. Only 5 questions need to be solved.
3. Question number 1 will be compulsory and covering the all modules.
4. Remaining questions will be mixed in nature. (e.g.- suppose Q.2 has part (a) from, module 3 then part (b) will be from any module other than module 3.)
5. In question paper weightage of each module will be proportional to number of respective lecture hours as mentioned in the syllabus.

Term work:

Term work shall consist of minimum five projects (PROJECTS SHALL BE DESIGNED ON THE SAME GUIDE- LINE OF GIVEN TEXT BOOK) and a written test.

The distribution of marks for term work shall be as follows,
Laboratory work (Tutorial/Project and Journal) : 15 marks.
Test (at least one) : 10 marks.

The final certification and acceptance of term-work ensures the satisfactory performance of laboratory work and minimum passing in the term-work.

Recommended Books:

1. Jagdish Krishnawamy , R J Ranjit Daniels, " Environmental Studies", Wiley India Private Ltd. New Delhi

2. Anindita Basak, Environmental Studies, Pearson
3. Deeksha Dave , “Textbook of Environmental Studies”, Cengage learning, THOMSON INDIA EDITION
4. Benny Joseph” Environmental Studies”Tata McGRAW HILL
5. D. L. Manjunath, Environmental Studies, Pearson
6. R.Rajgopalan, Environmental Studies, Oxford
7. Erach Bharucha, Textbook of Environmental Studies , Universities Press/Orient BlackSwan
8. Alok Debi, Environmental science and engineering, university press
9. A. Nagraj, Jeevan Vidya- A Primer.