



DHANALAKSHMI SRINIVASAN INSTITUTE OF TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Anna University)

NH - 45, Trichy - Chennai Trunk Road,

SAMAYAPURAM, TRICHY - 621 112.

E.mail: dsit2011@gmail.com Website: www.dsit.ac.in

COURSE PLAN

Sub. Code : GE8291	Branch / Year / SEM: B.E CSE /I /II
Sub. Name : Environmental Science & Engineering	Batch : 2019-2023
Staff Name :	Academic Year: 2018-19 (EVEN)

COURSE OBJECTIVES

- ✚ Environmental Pollution or problems cannot be solved by mere laws.
- ✚ Public participation is an important aspect which serves the environmental Protection.
- ✚ One will obtain knowledge on the following after completing the course.
- ✚ Public awareness of environment at infant stage.
- ✚ Ignorance and incomplete knowledge has lead to misconceptions.
- ✚ Development and improvement in standard of living has lead to serious environmental disasters.

TEXT BOOKS

- T1. Benny Joseph, =Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2006.
- T2. Gilbert M. Masters, =Introduction to Environmental Engineering and Science', edition, Pearson Education, 2004.

REFERENCE BOOKS

- R1. Dharmendra S. Sengar, =Environmental law', Prentice hall of India PVT LTD, New Delhi, 2007.
- R2. Erach Bharucha, —Textbook of Environmental Studies, Universities Press(I) PVT, LTD, Hyderabad, 2015.
- R3. Rajagopalan, R, =Environmental Studies-From Crisis to Cure', Oxford University Press, 2005.
- R4. G. Tyler Miller and Scott E. Spoolman, —Environmental Science, Cengage Learning India PVT, LTD, Delhi, 2014.



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GE8291 ENVIRONMENTAL SCIENCE AND ENGINEERING

L T P C 3 0 0 3

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 14

Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity. Field study of common plants, insects, birds; Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II ENVIRONMENTAL POLLUTION 8

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – solid waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides. Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT III NATURAL RESOURCES 10

Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over- utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water



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logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. case studies – 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 of resources for sustainable lifestyles. Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT

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From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization- environmental ethics: Issues and possible solutions – climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – wasteland reclamation – consumerism and waste products – environment production act – Air (Prevention and Control of Pollution) act – Water (Prevention and control of Pollution) act – Wildlife protection act – Forest conservation act – enforcement machinery involved in environmental legislation- central and state pollution control boards- Public awareness.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT

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Population growth, variation among nations – population explosion – family welfare programme – environment and human health – human rights – value education – HIV / AIDS – women and child welfare – role of information technology in environment and human health – Case studies.

TOTAL: 45

STAFF IN-CHARGE

HOD

Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
UNIT I ENVIRONMENT, ECOSYSTEM AND BIODIVERSITY						(14)
1	Environment scope and importance	T1	2	BB	1	1
2	Food chain , web , Pyramids	T1	76	BB	1	2
3	Oxygen cycle and Nitrogen cycle	T1	82		1	3
4	Concept of an Ecosystem, Structure and function of an Ecosystem	T1	75	BB	1	4
5	Energy flow and Ecological Succession	T1	76	BB	1	5
6	Forest Ecosystem,	T1	85	PPT	1	6
7	Grassland Ecosystem	T1	88			7
8	Aquatic ecosystem	T1	88	PPT	1	8
9	Ocean ecosystem	T1	88	PPT	1	9
10	Biodiversity-Significance, Classification and Value of Biodiversity.	T1	96	BB	1	10
11	India as a mega-diversity nation	T1	103	BB	1	11
12	Biodiversity-Threats, Habitat,	T1	105	BB	1	12
13	Hot Spots of India		108			13
14	Conservation of biodiversity	T1	112	BB	1	14
LEARNING OUTCOMES						
At the end of unit, students should be able to						
<ul style="list-style-type: none"> • Know the concepts of Ecosystem & biodiversity • Identify the Rank of India in biodiversity among various nations • Know about the various nutrients cycle 						
UNIT II ENVIRONMENTAL POLLUTION						(8)
15	Air Pollution , Water Pollution	T1	119 ,137	BB	1	15
16	Soil Pollution	T1	158	BB	1	16
17	Marine Pollution	T1	160	BB	1	17
18	Noise Pollution	T1	165	BB	1	18
19	Thermal Pollution Nuclear Pollution	T1	168 , 187	BB	1	19
20	Solid waste Management,	T1	169	BB	1	20
21	Role of an individual in prevention of pollution	T1	198	BB	1	21

22	Disaster Management	T1	200	BB	1	22
LEARNING OUTCOMES						
At the end of unit, students should be able to						
<ul style="list-style-type: none"> Understand about the major pollutants and their problems on environment. Analyze the preventive measures of pollution. Know the Role of an individual in prevention of pollution. 						
UNIT III NATURAL RESOURCES						(10)
23	Forest Resources , Deforestation	T1	17, 18	BB	1	23
24	Timber extraction ,mining ,	T1	23 ,25,	BB	1	24
25	dam and their effects	T1	29	BB	1	25
26	Water Resources	T1	35	BB	1	26
27	Mineral Resources	T1	27	BB	1	27
28	Food Resources &	T1	48	BB	1	28
29	Energy Resources	T1	57	BB	1	29
30	Land Resources	T1	64	BB	1	30
31	Desertification	T1	67	BB	1	31
32	Role of an individual in conservation of natural resources	-	-	BB	1	32
LEARNING OUTCOMES						
At the end of unit, students should be able to						
<ul style="list-style-type: none"> Understand the problems of using fertilizers & Pesticides in agriculture field. Knowledge about the natural resources Know the importance of saving the energy . 						
Topic No.	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT						(7)
33	Unsustainable to Sustainable development Urban Problems, Resettlement and rehabilitation.	T1	210,212	BB	1	33
34	Water Conservation –Rain water Harvesting & Watershed Management	T1	215, 220	BB	1	34
35	Nuclear Accidents and Holocaust	T1	224, 246	BB	1	35

36	Acid rain , Ozone layer depletion	T1	223, 224	BB	1	36
37	Global warming	T1	225	BB	1	37
38	Air Prevention Act and Water Prevention Act	T1	238, 237	BB	1	38
39	Wildlife Protection Act and Forest Conservation Act	T1	239 , 242	BB	1	39

LEARNING OUTCOMES

At the end of unit, students should be able to

- Know the environmental problems
- Analyze the green chemistry
- Know about the laws against the natural resources.

UNIT V HUMAN POPULATION AND THE ENVIRONMENTAL

(6)

40	Population Growth, Value Education	T1	266	BB	1	40
41	Family Welfare Environmental and Human Health	T1	282	BB	1	41
42	Human Rights & Value Education	T1	274	BB	1	42
43	HIV/AIDS ,	T1	278	BB	1	43
44	Women and Child Welfare	T1	286	BB	1	44
45	Role of Information Technology in Environmenta & Human Health	T1	288	BB	1	45

LEARNING OUTCOMES

At the end of unit, students should be able to

- Know the population growth
- Know the value of education
- Know about the women & child welfare

COURSE OUTCOMES

At the end of the course, the students will be able to

- Demonstrate the environment and its importance to our society.
 - Explain the responsibility of an individual to preserve a quality environment.
 - . Recall the environmental ethics and they will give moral support for solving the environmental issues.
 - Estimate the value natural resources for the current and feature generation.
 - Know the proper usage of human rights & value of education.
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INTERNAL ASSESSMENT DETAILS

ASSESSMENT NUMBER	I	II	MODEL
Topic no's	1-22	23-39	01-45
Date			

ASSIGNMENT DETAILS

ASSIGNMENT	I	II	III
Topic no's for reference	1-22	23-39	20,39,40-45
Deadline			

ASSIGNMENT TOPICS

ASS: NO	SECTION	REG:NO	BATCH NO	DESCRIPTIVE QUESTIONS/TOPICS (MINIMUM 8 PAGES/SLIDES)
I			I	Presentation: Explain the structure & Components of Aquatic Ecosystem. (Pond , lake , River & Ocean)
			II	Assignment : Write the Value of Biodiversity. Explain about Hot spots.Explain the Conservation of Biodiversity.
			III	Seminar: Explain the various air pollutant sources and their effects Air Pollution
II			II	Presentation: Forest resources & Food resources
			III	Assignment : Explain the various air pollutant sources and their effects Air Pollution
			I	Seminar: Explain the effects over exploitation of Water resources & mineral resources

III		III	Presentation: Explain the Population Growth Variation and population Explosion
		I	Assignment : Write short note on : Women & Child welfare ,Role of IT in environment
		II	Seminar: Explain the various types of Solid waste management and their recycling. Write note on Disaster management.

Prepared by
(A.SYLVIA)

Verified by
HOD

Approved by
Principal