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COURSE PLAN

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

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, Hydrabad, 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

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 7

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 6

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 • 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

- 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

- 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.

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