

MOHAMMED SATHAK A J COLLEGE OF ENGINEERING

Siruseri IT park, OMR, Chennai - 603103

LESSON PLAN							
Department of Science and Humanities							
Name of the Subject	Environmental Science and Engineering			Name of the handling Faculty	Dr. A. Balakrishnan Dr. B. Devi Bala		
Subject Code	GE8291			Year / Sem	II / IV		
Acad Year	2021-2022			Batch			
Course Objective							
To the study of nature and the facts about environment.							
• To finding and implementing scientific, technological, economic and political solutions to environmental problems.							
• To study the interrelationship between living organism and environment.							
• To appreciate the importance of environment by assessing its impact on the human world; envision the surrounding environment, its function							
• To study the dynamic processes and understand the features of the earth’s interior and surface.							
To study the integrated themes and biodiversity, natural resources, pollution control and waste management							
Course Outcome							
Environmental Pollution or problems can be solved by mere laws.							
Public participation is an important aspect which serves the environmental Protection.							
Students will be free from Ignorance and have complete knowledge towards environment							
Students can develop and improve their standard of living							
Students can manage serious environmental disasters							
Lesson Plan							
Sl. No.	Topic(s)	T / R*	Periods Required	Mode of Teaching (BB / PPT / NPTEL /	Blooms Level (L1-L6)	CO	PO
		Book					
UNIT I : ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY							
1	Definition, scope and importance of environment-need for public awareness	T1	1	Chalk and Talk, PPT	L1	CO1	PO1
2	Concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers	T1	2	Chalk and Talk, PPT	L1	CO1	PO2
3	Energy flow in the ecosystem	T1	3	Chalk and Talk, PPT	L1	CO1	PO6
4	Ecological succession processes	T1	4	Chalk and Talk, PPT	L2	CO1	PO7
5	Food chain and food webs-Ecological pyramids	T1	5	Chalk and Talk, PPT	L2	CO1	PO8
6	Introduction, types, characteristic features, structure and function of the forest ecosystem	T1	6	Chalk and Talk, PPT	L2	CO1	PO1
7	Introduction, types, characteristic features, structure and function of the (a) grassland ecosystem (b)desert ecosystem	T1	7	Chalk and Talk, PPT	L3	CO1	PO2
8	Introduction, types, characteristic features, structure and function of the aquatic ecosystem (ponds,streams, lakes, rivers, oceans, estuaries)	T1	8	Chalk and Talk, PPT	L3	CO1	PO12
9	Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India	T1	9	Chalk and Talk, PPT	L1	CO1	PO12
10	Values of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, national and local levels- India as a mega-diversity	T1	10	Chalk and Talk, PPT	L1	CO1	PO1

11	Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India	T1	11	Chalk and Talk, PPT	L2	CO1	PO2
12	Conservation of biodiversity: In-situ and ex-situ conservation of biodiversity	T1	12	Chalk and Talk, PPT	L2	CO1	PO6

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any

Evaluation method

UNIT II : ENVIRONMENTAL POLLUTION

13	Introduction, Definition – causes, effects and control measures of Air pollution	T1	13	Chalk and Talk, PPT	L2	CO2	PO1
14	Definition – causes, effects and control measures of water pollution	T1	14	Chalk and Talk, PPT	L2	CO2	PO2
15	Definition – causes, effects and control measures of soil pollution and marine pollution	T1	15	Chalk and Talk, PPT	L2	CO2	PO6
16	Definition-Causes, effects and control measures of noise and thermal pollution	T1	16	Chalk and Talk, PPT	L2	CO2	PO7
17	Nuclear hazards–solid waste management: causes, effects and control measures of municipal solid wastes	T1	17	Chalk and Talk, PPT	L2	CO2	PO9
18	Role of an individual in prevention of pollution-disaster management: floods, earthquake	T1	18	Chalk and Talk, PPT	L2	CO2	PO12
19	Disaster management-cyclone and landslides	T1	19	Chalk and Talk, PPT	L2	CO2	PO12

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Evaluation method

UNIT III : NATURAL RESOURCES

20	Forest resources: Use and over-exploitation, deforestation, case studies.	T1	20	Chalk and Talk, PPT	L1	CO3	PO1
21	Timber extraction, mining, dams and their effects on forests and tribal people	T1	21	Chalk and Talk, PPT	L1	CO3	PO2
22	Water resources: Use and overutilization of surface and ground water, floods, drought, water conflicts, dams-benefits and problems	T1	22	Chalk and Talk, PPT	L2	CO3	PO6
23	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies	T1	23	Chalk and Talk, PPT	L2	CO3	PO7
24	Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case	T1	24	Chalk and Talk, PPT	L2	CO3	PO9
25	Energy resources: Growing energy needs, renewable and non-renewable energy sources	T1	25	Chalk and Talk, PPT	L2	CO3	PO12
26	Use of alternate energy sources, case studies	T1	26	Chalk and Talk, PPT	L3	CO3	PO12
27	Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification	T1	27	Chalk and Talk, PPT	L2	CO3	PO1
28	Role of an individual in conservation of natural resources-Equitable use of resources for sustainable lifestyles.	T1	28	Chalk and Talk, PPT	L2	CO3	PO2

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any

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UNIT IV : SOCIAL ISSUES AND THE ENVIRONMENT

29	From unsustainable to sustainable development – urban problems related to energy- water conservation,	T1	29	Chalk and Talk, PPT	L1	CO4	PO1
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30	Resettlement and rehabilitation of people; its problems and concerns,	T1	30	Chalk and Talk, PPT	L2	CO4	PO2
31	Rain water harvesting, watershed management, Environmental ethics:	T1	31	Chalk and Talk, PPT	L2	CO4	PO6
32	Ozone layer depletion, nuclear accidents and holocaust, case studies. Wasteland reclamation	T1	32	Chalk and Talk, PPT	L2	CO4	PO7
33	Consumerism and waste products	T1	33	Chalk and Talk, PPT	L2	CO4	PO9
34	Air act (Prevention and control of pollution) – Wildlife protection act Forest conservation	T1	34	Chalk and Talk, PPT	L3	CO4	PO12
35	Water act, Environmental protection act	T1	35	Chalk and Talk, PPT	L3	CO4	PO12
36	Enforcement machinery involved in environmental legislation- central and state pollution control boards-public awareness	T1	36	Chalk and Talk, PPT	L3	CO4	PO1
37	Enforcement machinery involved in environmental legislation- central and state pollution control boards-public awareness	T1	37	Chalk and Talk, PPT	L3	CO4	PO2
38	case studies – role of non-governmental organization, Issues and possible solutions –	T1	38	Chalk and Talk, PPT	L3	CO4	PO12
39	climate change, global warning, acid rain	T1	39	Chalk and Talk, PPT	L2	CO4	PO12

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any

Evaluation method

UNIT V : HUMAN POPULATION AND THE ENVIRONMENT

40	Population growth, variation among nations – population explosion	T1	40	Chalk and Talk, PPT	L1	CO5	PO1
41	Family welfare programme – environment and human health	T1	41	Chalk and Talk, PPT	L2	CO5	PO2
42	Human rights – value education	T1	42	Chalk and Talk, PPT	L2	CO5	PO6
43	HIV / AIDS	T1	43	Chalk and Talk, PPT	L2	CO5	PO7
44	Women and child welfare	T1	44	Chalk and Talk, PPT	L2	CO5	PO8
45	Role of information technology in environment and human health – Case studies.	T1	45	Chalk and Talk, PPT	L3	CO5	PO12

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any

Evaluation method

Content Beyond the Syllabus Planned

1	
2	

Text Books

1	Dr.A.Ravikrishnan., Environmental Science and Engineering-20th edition, Hitech Publishing Pvt., Ltd, 2016
2	Gilbert M.Masters, „Introduction to Environmental Engineering and Science“, 2nd edition, Pearson Education, 2004
3	Benny Joseph, „Environmental Science and Engineering“, Tata McGraw Hill, New Delhi, 2006.

Reference Books

1	Trivedi R.K. „Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards“, Vol. I and II, Enviro Media.
2	Cunningham, W.P.Cooper., T.H. Gorhani, „Environmental Encyclopedia“, Jaico Publishing House, Mumbai, 2001.
3	Dharmendra S. Sengar, „Environmental law“, Prentice hall of India PVT LTD, New Delhi, 2007.

Website / URL References

1	https://easyengineering.net/ge8291-environmental-science-and-engineering/
2	https://studentsfocus.com/ge8291-ese-notes-environmental-science-and-engineering-notes-ece-4th-sem/

3	https://padeepz.net/ge8291-notes-environmental-science-engineering/														
Blooms Level															
Level 1 (L1) : Remembering Level 2 (L2) : Understanding Level 3 (L3) : Applying					Lower Order Thinking	Fixed Hour	Level 4 (L4) : Analysing					Higher Order Thinking	Projects / Mini Projects		
							Level 5 (L5) : Evaluating								
							Level 6 (L6) : Creating								
Mapping syllabus with Bloom's Taxonomy LOT and HOT															
Unit No	Unit Name					L1	L2	L3	L4	L5	L6	LOT	HOT	Total	
Unit 1	ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY					5	3	2	0	0	0	10	0	10	
Unit 2	Environmental pollution					0	7	0	0	0	0	7	0	7	
Unit 3	Natural Resources					2	6	1	0	0	0	9	0	9	
Unit 4	Social Issues and Its Environment					1	6	5	0	0	0	12	0	12	
Unit 5	Human Polupation and its Environme					1	4	1	0	0	0	6	0	6	
Total					9	26	9	0	0	0	44	0	44		
Total Percentage					20.5	59.1	20.455	0	0	0	100	0	100		
CO PO Mapping															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	3	2	0	0	0	1	1	1	0	0	0	2	0	0	
CO2	2	2	0	0	0	1	1	0	2	0	0	2	0	0	
CO3	3	3	0	0	0	1	1	0	1	0	0	2	0	0	
CO4	2	2	0	0	0	1	1	0	1	0	0	3	0	0	
CO5	2	2	0	0	0	1	1	1	0	0	0	2	0	0	
Avg	2.4	2.4	0	0	0	1	1	1	1.5	0	0	2.2	0	0	
Justification for CO-PO mapping															
CO1	• Ability to apply knowledge of environmental science for creativity and product designing in engineering and technology.														
CO2	• Ability to recognize the need for to engage in lifelong learning and to understand the professional and ethical responsibilities.														
CO3	• Ability to produce human capital who will be a responsible citizen, besides excelling in his/her own domain.														
CO4	• Ability to participate and succeed in competitive examinations like GATE, GRE etc. and also in other professional examinations at various levels.														
CO5	• Ability to produce a complete technocrat who is socially aware with adequate knowledge of his/her surroundings.														
3		High level			2			Moderate level			1		Low level		
Name & Sign of Faculty Incharge : Dr. A. Balakrishnan, Dr. B. Devi Bala															
Name & Sign of Subject Expert : Dr. A. Balakrishnan															
Head of the Department : Dr. A. Balakrishnan															