SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Department of Applied Chemistry	LP: Sub Code **GE18251**
B.E/B.Tech/M.E/M.Tech : Common For All Branches Semester : Even Sub. Code / Sub. Name : **GE18251 / ENVIRONMENTAL SCIENCE AND ENGINEERING** Regulation :2018 Unit : I	Rev. No: 01 Date: 01-04-2022

Unit Syllabus: ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY

Definition, scope and importance of environment - need for public awareness - concept of an ecosystem - structure and function of an ecosystem - energy flow in the ecosystem - ecological succession - food chains, food webs and ecological pyramids - Introduction, types, characteristic features, structure and function of the forest ecosystem, grassland ecosystem, desert ecosystem, aquatic ecosystems, Introduction to biodiversity definition: genetic, species and ecosystem diversity - Biogeographical classification of India - value of biodiversity - Biodiversity at global, national and local levels - India as a mega-diversity nation - hot-spots of biodiversity - threats to biodiversity - man-wildlife conflicts - endangered and endemic species of India - conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.

Objective:

- To create an awareness about the fundamentals and importance of ecosystems and biodiversity to the students.
- To study the interrelationship between living organism and environment.

Session No *	Topics to be covered	Ref	Teaching Aids
1.	Definition, scope and importance of environment - need for public awareness	T1, Ch 4, 127-166	PPT
2.	Concept of an ecosystem - structure and function of an ecosystem	R4, Ch2, 20-24	PPT
3.	Energy flow in the ecosystem – Biogeochemical cycles - (Nitrogen, Oxygen) ecological succession	R1, Ch.3, 113-118,	PPT
4.	Food chains, food webs and ecological pyramids and its types	T1, Ch4, p76-78	PPT
5.	Introduction, types, characteristic features, structure and function of the forest ecosystem	R4, Ch4, 36-43	PPT
6.	Introduction, types, characteristic features, structure and function of Grassland ecosystem & desert ecosystem	R4, Ch4, 36-43, 43-65	PPT
7.	Aquatic ecosystems, Introduction to biodiversity definition: genetic, species and ecosystem diversity	R3, Ch4, 43-65,	PPT
8.	Biogeographical classification of India - values of biodiversity, Biodiversity at global, national and local levels	T2, Ch5, 94-101	PPT
9.	India as a mega-diversity nation - hot-spots of biodiversity	R4, Ch6, 71-82	PPT
10.	Threats to biodiversity - man-wildlife conflicts	R4, Ch6, 83-84	PPT
11.	Endangered and endemic species of India	R4, Ch6, 83-84	PPT
12.	Conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.	R5, Ch6, 85-95	PPT
Content beyond syllabus covered (if any): Definition, importance of Risk & hazards			

* Session duration: 50 minutes

Sub. Code / Sub.Name:GE18251 / ENVIRONMENTAL SCIENCE AND ENGINEERING
Unit : II

Unit Syllabus :NATURAL RESOURCES: 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 - role of an individual in conservation of natural resources - Equitable use of resources for sustainable lifestyles.

Objective:

- To impart knowledge about the dynamic process available in the nature and resources available on this earth crust.

Session No *	Topics to be covered	Ref	Teaching Aids
13.	Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction -	T2, Ch2, p17- 27	PPT
14.	Case studies - mining, dams and their effects on forests and tribal people	T2, Ch2, p17- 27	PPT
15.	Water resources: Use and over - utilization of surface and ground water, floods, drought	T2, Ch2, p28- 47	PPT
16.	Conflicts over water – National and International, Dams - benefits and problems	T2, Ch2, p17- 27	PPT
17.	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources - case studies	R4, Ch10, p161-169	PPT
18.	Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture –fertilizer – Eutrophication, Blue baby syndrome etc , pesticide problems and bio-magnification.	R4, Ch10, p156-161	PPT
19.	Water logging, salinity – Causes, effects and control measures - case studies - Energy resources: Growing energy needs, Non renewable resources – types, uses	R4, Ch10, p153-156	PPT
20.	Alternate energy sources – types and uses - case studies	R4, Ch10, p153-156	PPT
21.	Land resources: Land as a resource – land degradation - role of an individual in conservation of natural resources	R4, Ch10, p153-156	PPT
22.	Equitable use of resources for sustainable lifestyles	R4, Ch2, p82	PPT

Content beyond syllabus covered (if any): Genetically Modified Organisms (GMO'S) and its problems

*** Session duration: 50 mins**

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COURSE DELIVERY PLAN - THEORY

Sub Code / Sub Name: **GE18251 / ENVIRONMENTAL SCIENCE AND ENGINEERING**
Unit : III

Unit Syllabus :ENVIRONMENTAL POLLUTION AND DISASTER MANAGEMENT: Definition - causes, effects and control measures Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards - solid waste management: causes, effects and control measures of municipal solid wastes, e-Waste, risk related to e-Waste - role of an individual in prevention of pollution - pollution case studies - disaster management: floods, earthquake, cyclone and landslides, land degradation, man induced landslides, soil erosion and desertification.

Objective:

- To improve the knowledge about disaster management and the various types of environmental pollution and their effects on plants and animals.
- To implement scientific, technological, economic and political solutions to environmental problems.

Session No *	Topics to be covered	Ref	Teaching Aids
23.	Definition - causes, effects and control measures of Air pollution	T2, Ch6, 118-130	PPT
24.	Definition - causes, effects and control measures of Water pollution (primary, secondary and tertiary treatment of wastewater/sewage))	T2, Ch6, 137-145	PPT
25.	Definition - causes, effects and control measures of Soil pollution, Nuclear hazards	T2, Ch6, 153-160	PPT
26.	Definition - causes, effects and control measures of Marine & Noise pollution	T2, Ch6, 160-168	PPT
27.	Definition - causes, effects and control measures of Thermal pollution & Nuclear hazards	T2, Ch6, 168-169	PPT
28.	Solid waste management: types, sources, causes, effects and control measures of municipal solid wastes (disposal methods)	T2, Ch6, 153-160	PPT
29.	e-Waste, risk related to e-Waste - role of an individual in prevention of pollution	T2, Ch5, 204-206	PPT
30.	Pollution case studies – MRL, Taj trapezium case, Bhopal gas tragedy, Arsenic poisoning, Palar river pollution, Minamata disease, Chernobyl disaster etc	T2, Ch6, 200-202	PPT
31.	Disaster management: floods, earthquake, cyclone and landslides, land degradation	T2, Ch6,200-202 R4, Ch10, p153-156	PPT
32.	Man induced landslides, soil erosion and desertification.	T2, Ch6,200-202	PPT

Content beyond syllabus covered (if any): Biochemical degradation of pollutants

Sub Code / Sub Name: **GE18251 / ENVIRONMENTAL SCIENCE AND ENGINEERING**
Unit : IV

Unit Syllabus : SOCIAL ISSUES AND THE ENVIRONMENT: 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 - Principles of green chemistry, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies - wasteland reclamation - consumerism and waste products - Environment protection act - Air (Prevention and Control of Pollution) act - Water (Prevention and control of Pollution) act - Wildlife protection act - Forest conservation act - central and state pollution control boards - Public awareness.

Objective:

- To elucidate the students about the sustainable development, water conservation, social issues, role of NGO's and various laws available in the country to protect the environment

Session No *	Topics to be covered	Ref	Teaching Aids
33.	From unsustainable to sustainable development - urban problems related to energy - water conservation , rain water harvesting, watershed management	T2, Ch7, 210-220	PPT
34.	Resettlement and rehabilitation of people; its problems and concerns, case studies	R5, Ch18,289-298	PPT
35.	Role of non-governmental organization- environmental ethics: Issues and possible solutions	R5, Ch18,289-298	PPT
36.	Principles of green chemistry, climate change, global warming, acid rain, ozone layer depletion	R5, Ch18,289-298, R4, Ch11, 174-176	PPT
37.	Nuclear accidents and holocaust, case studies - wasteland reclamation - consumerism and waste products	T2, Ch7,243-246	PPT
38.	Environment protection act - Air (Prevention and Control of Pollution) act - Water (Prevention and control of Pollution) act	T2, Ch7, 243-246	PPT
39.	Forest conservation act - central and state pollution control boards - Public awareness.	R3, Ch5, 79-94	PPT

Content beyond syllabus covered (if any): Biomedical Waste Management

Sub Code / Sub Name: **GE18251 / ENVIRONMENTAL SCIENCE AND ENGINEERING**
Unit : V

Unit Syllabus : HUMAN POPULATION AND THE ENVIRONMENT - Population growth, variation among nations - population explosion - family welfare programme – environment and human health - human rights - value education - HIV / AIDS, Swine flu, Dengue fever - women and child welfare - role of information technology in environment and human health management - case studies.

Objective:

- To impart knowledge about the Population, family welfare programmes and Environmental Management to the students.

Session No *	Topics to be covered	Ref	Teaching Aids
40.	Population growth, variation among nations - population explosion, Doubling time, TFR	R4, Ch15, 200-202	PPT
41.	Family welfare programme – various methods	R4, Ch15, 200-202	PPT
42.	Environment and human health - human rights - value education	T2, Ch8, 274-277, T2, Ch8, 277 R6, Ch17, 268-270	PPT
43.	HIV / AIDS, Swine flu, Dengue fever - women and child welfare -	T2, Ch8, 277 R6, Ch17, 268-270	PPT
44.	Role of information technology in environment GIS, remote sensing - case studies.	T2, Ch7, 246- 251	PPT
45.	Role of information technology in human health management - case studies.	T2, Ch8, 288- 289	PPT
Content beyond syllabus covered (if any): Environmental Impact Analysis			

TEXT BOOKS:

1. Benny Joseph, "Environmental Science and Engineering", Tata McGraw-Hill, New Delhi, 2012
2. Gilbert M.Masters, "Introduction to Environmental Engineering and Science", 2nd edition, Pearson Education, 2010.

REFERENCES:

1. **REFERENCES:**

1. R.K. Trivedi, ‘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 Publ., House, Mumbai, 2001.

3. Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT LTD, New Delhi, 2007.
4. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press (2005).
5. Wager. K. D. "Environmental Management", W.B. Saunders Co., Philadelphia.
6. Townsend C, Harper J and Michel Begon, "Essentials of Ecology", Blackwell Science.
7. Trivedi R. K, and P.K. Goel, " Introduction to Air Pollution", Techno-Science Publications.

	Prepared by	Approved by
Signature		
Name	Dr. Stanly	Dr. G. Devasagayam
Designation	Associate Professor	Professor
Date	01-04-2022	01-04-2022
Remarks *:		
Remarks *:		

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD

SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Department of Applied Chemistry		
Academic Year	: 2021-2022	Semester: ODD
B.E/B.Tech/~~M.E/M.Tech~~	: All Branches	Regulation : 2018
PG Specialisation	:	
Sub. Code / Sub. Name	: GE18251 / ENVIRONMENTAL SCIENCE AND ENGINEERING	

CO	Statements **On the successful completion of the course, students will be able to**	RBT* Level
CO1	Describe the importance of ecosystems, biodiversity and its protection.	U
CO2	Implement the knowledge which requires optimum use of various natural resources for the conservation of natural resources.	AP
CO3	Classify the different types of pollution, their effects and control measures. Also apply the knowledge gained for disaster management.	AP
CO4	Describe the sustainable development, social issues, role of NGO's and various laws available in the country for environmental protection.	U
CO5	Recognize the importance of women and child welfare, prevention of HIV /AIDS and usage of technology for environmental management.	U

***** Revised Bloom's Taxonomy

Mapping CO – PO – PSO *

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO-1	PSO-2
CO1	X			X	X	X	X	X	X		X	X		
CO2	X			X		X		X	X		X	X		
CO3	X			X	X	X	X		X		X			
CO4	X			X	X	X	X	X	X		X			
CO5	X	X		X	X						X			

* Put a 'X' for the mapping

CO ATTAINMENT

CO	Target (%) (A)	Achieved (%) (B)	Gap (%) (A-B)
CO1	70		
CO2	60		
CO3	70		
CO4	70		
CO5	70		

BRIDGING THE GAP IN CO

CO	ACTION PLAN
CO1	
CO2	
CO3	
CO4	
CO5	

PO ATTAINMENT

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO-1	PSO-2
Attainment (%)														

Dr. Stanly S	**Dr. G. Devasagayam**
Signature of Faculty / Course Coordinator	**Signature of Module Coordinator**