DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE
(AUTONOMOUS)
(Approved by AICTE & Affiliated to Anna University, Chennai)
Re-Accredited with 'A' Grade by NAAC, Accredited by TCS
Accredited by NBA – BME, ECE & EEE
PERAMBALUR - 621 212. Tamil Nadu.
website : www.dsengg.ac.in

COURSE PLAN

Name of the Faculty				
Designation/Department	Assistant professor/ Chemistry			
Course Code/Name	**U20HS202 ENVIRONMENTAL SCIENCES AND ENGINEERING**			
Year/Section/Department	II/ECE-B/BME-A/MECH			
Credits Details	L: 3	T: 0	P: 0	C: 2
Total Contact Hours Required	30			

Syllabus:

UNIT I Ecosystem and Biodiversity	**6**
Definition, scope and importance of environment – need for public awareness. Eco-system and Energy flow– ecological succession. Types of biodiversity: genetic, species and ecosystem diversity– values of biodiversity, 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.	
UNIT II Environmental Pollution	**6**
Causes, Effects and Preventive measures of Water, Soil, Air and Noise Pollutions. Solid, Hazardous and E-Waste management. Case studies on Occupational Health and Safety Management system (OHASMS). Environmental protection, Environmental protection acts.	
UNIT III Renewable Sources of Energy	**6**
Energy management and conservation, New Energy Sources: Need of new sources. Different types new energy sources. Applications of- Hydrogen energy, Ocean energy resources, Tidal energy conversion. Concept, origin and power plants of geothermal energy.	
UNIT IV Environmental Issues	**6**
Social Issues and possible solutions – climate change, global warming, acid rain,ozone layer depletion, nuclear accidents and holocaust - Population growth, variation among nations population explosion – family welfare programme – human rights – value education – HIV / AIDS – women and child welfare.	
UNIT V Sustainability Practices	**6**
Zero waste and R concept, Circular economy, ISO 14000 Series, Material Life cycle assessment,Environmental Impact Assessment. Sustainable habitat:Development,GDP,Sustainability-Green buildings, Green materials, Energyefficiency, Sustainable transports.Sustainable energy Non-conventional Sources, Energy Cycles-carbon cycle, emission and sequestration, Green Engineering: Sustainable urbanization- Socio-economic andtechnologicalchange.	

Objective:

- To introduce the basic concepts of environment, ecosystems and biodiversity and emphasize on the biodiversity of India and its conservation.
- To impart knowledge on the causes, effects and control or prevention measures of environmental pollution and natural disasters.
- To facilitate the understanding of global and Indian scenario of renewable and non renewable resources, causes of their degradation and measures to preserve them.
- To familiarize the concept of sustainable development goals and appreciate the interdependence of economic and social aspects of sustainability, recognize and analyze climate changes, concept of carbon credit and the challenges of environmental management.
- To inculcate and embrace sustainability practices and develop a broader understanding on green materials, energy cycles and analyze the role of sustainable urbanization..

Text Book:

T1.Anubha Kaushik and C. P. Kaushik's "Perspectives in Environmental Studies", 6th Edition, New Age International Publishers ,2018.

T2. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2016

T3. Gilbert M.Masters, "Introduction to Environmental Engineering and Science", edition, Pearson Education, 2004.

Reference Book:

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.

Website:

W1: https://www.brainkart.com
W 2. https://www.padeepz.net
W 3 . https://learnengineering.in
W 4. https://www.studentsfocus.com

Online Mode of Study:

W1: https//nptel.ac.in/courses/122/106/1221106028/
W2: https://www.seek.com.au/learning/search/environmental-studies-courses/mode-online
W3: https://www.shiksha.com/online-courses/environmental-studies-certification
W4: https://www.publicservicedegrees.org/online-degrees/environmental-science/
W5:https://www.manchester.ac.uk/study/online-blended-learning/courses/pollution-environmental-control-online/

Course Plan:

Topic Number	Topic	Reference Detail	Page Number	Mode of teaching	Number of Periods Required	Cumulative Period
UNIT I - Ecosystem and Biodiversity						
1	Definition, scope and importance of environment , Need for public Awareness	T1	2	PPT	1	1
2	Eco-system and Energy flow ecological succession.	T1	76	Black Board	1	2
3	Types of biodiversity genetic, species and ecosystem diversity	T1	82	Black Board	1	3
4	Values of biodiversity, India as a mega-diversity nation hot-spots of biodiversity	T1	75	PPT	1	4
5	Threats to biodiversity habitat loss, poaching of wildlife, man-wildlife conflicts	T2	76	PPT	1	5
6	Endangered and endemic species of India Conservation of biodiversity In-situ and ex-situ.	T1	85	Black Board	1	6
Outcome of Unit I: **CO1:** Introduce the basic concepts of environment, ecosystems and biodiversity and emphasize on the biodiversity of India and its conservation.						
UNIT II - Environmental Pollution						
7	Water Pollution-Causes, Effects and Preventive measures	T1	156	PPT	1	7
8	Soil Pollution-Causes, Effects and Preventive measures	T1	158	Black Board	1	8
9	Air Pollution-Causes, Effects and Preventive measures	T1	160	Black Board	1	9
10	Noise Pollution-Causes, Effects and Preventive measures	T2	165	PPT	1	10
11	Solid, Hazardous and E-Waste management, OHASMS	T1	168 , 187	PPT	1	11
12	Environmental protection Environmental protection acts	T1	239 , 242	Black Board	1	12
Outcome of Unit II: **CO2:** knowledge on the causes, effects and control or prevention measures of environmental pollution and natural disasters.						
UNIT III - Renewable Sources of Energy						

13	Energy management and conservation	T 2	105	PPT	1	13
14	New Energy Sources Need of new sources	T 2	107	Black Board	1	14
15	Different types new energy sources	T 2	115	Black Board	1	15
16	Applications of- Hydrogen energy, Ocean energy resources	T 2	119	PPT	1	16
17	Tidal energy conversion	T 2	91	PPT	1	17
18	Concept, origin and power plants of geothermal energy	T 2	93	Black Board	1	18

Outcome of Unit III:

CO3: facilitate the understanding of global and Indian scenario of renewable and non- renewable resources, causes of their degradation and measures to preserve them.

UNIT IV - Environmental Issues

19	Social Issues and possible solutions	T1	210,212	PPT	1	19
20	climate change, global warming, acid rain, ozone layer depletion	T1	223, 224	Black Board	1	20
21	nuclear accidents and holocaust	R2	224, 246	Black Board	1	21
22	Population growth, variation among nations population explosion	R1	278	PPT	1	22
23	family welfare programme	T1	286	PPT	1	23
24	human rights – value education – HIV / AIDS – women and child welfare	T1	294	Black Board	1	24

Outcome of Unit IV:

CO4: familiarize the concept of sustainable development goals and appreciate the interdependence of economic and social aspects of sustainability, recognize and analyze climate changes, concept of carbon credit and the challenges of environmental management.

UNIT V - Sustainability Practices

25	Zero waste and R concept, Circular economy, ISO 14000 Series	T 2	99	PPT	1	25
26	Material Life cycle assessment, Environmental Impact Assessment	T 2	105	PPT	1	26

27	Sustainable habitat Development, GDP, Sustainability- Green buildings, Green materials, Energy efficiency, Sustainable transports	T 2	107	Black Board	1	27
28	Sustainable energy Non-conventional Sources	T 2	115	Black Board	1	28
29	Energy Cycles-carbon cycle, emission and sequestration, Green Engineering	T 2	119	PPT	1	29
30	Sustainable urbanization- Socio-economic and technological change	T1	210,212	Black Board	1	30

Outcome of Unit V:

CO5: Inculcate and embrace sustainability practices and develop a broader

CO6: Understanding on green materials, energy cycles and analyze the role of sustainable urbanization..

Course Outcome:

At the end of course: Students should be able to do:

CO1: Demonstrate the General concepts of Ecosystem, biodiversity and its importance.

CO2: Understand about the major pollutants and their problems on environment, analyze the preventive measures of pollution.

CO3: Knowledge about the natural resources and also Understand the problems of using fertilizers & Pesticides in agriculture field.

CO4: Know about the population growth how it is interfere with the environment.

CO5: Understand about the sustainable development and sustainable energy on environment

CO6: Analyze the importance of green materials uses of environment.

Course Outcome Vs Program Outcome Mapping:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	3	2	-	-	-	-	-	-	-	-
CO2	3	2	-	-	3	2	-	-	-	-	-	-	-	-
CO3	3	2	-	2	-	-	-	-	-	-	-	-	-	-
CO4	3	-	2	-	3	2	-	-	-	-	-	-	-	-
CO5	3	-	2	-	3	3	-	-	-	-	-	-	-	-
CO6	3	-	-	-	3	3	-	-	-	-	-	-	-	-
AVG	3	2	2	2	3	2	-	-	-	-	-	-	-	-

Content beyond Syllabus:

- Water treatment, Various methods, Quality & importance.
- Role of Information technology to Environmental Science.

Internal Evaluation Components:

Webportal	Assignment	Components	Topic Number with Topic / Unit Details	Relevance to CO
Webportal 1	**--**	Assessment – I (60)	Unit I and II	CO 1 & CO2
	1	Assignment – Handwritten (20)	1. Explain the structure, component and Function of Eco System . 2. Discus about the values and conservation of Bio Diversity	CO1 CO1
	2	Assignment – Poster Presentation / PPT (20)	1. Sources, causes, Effect and Control of Air Pollution. 2. Hazardous and E-Waste management, OHASMS	CO2 CO2
Webportal 2	**--**	Assessment – II (60)	Unit III and IV	CO3 & CO4
	3	Seminar (20)	1. Applications of- Hydrogen energy, Ocean energy resources. 2. Concept, origin and power plants of geothermal energy	CO3 CO3
	4	Case Study Report (20)	Social Issues and possible solutions	CO4
Webportal 3	**--**	Model Exam (75)	Unit I to V	CO1 to CO6
	5	MCQ (15)	Unit I to V	CO1 to CO6
	-	Course Attendance (10)	--	--

Submission Details:

Phase 1(Before AT 1)		Phase 2 (Before AT 2)		Phase 3 (Model)
Assignment 1	**Assignment 2**	**Assignment 3**	**Assignment 4**	**Assignment 5**

Google Class Code Details:Gty3dw3

Class Name: II AERO

PLAN OF ASSESSMENT TEST –DISTRIBUTION OF MARKS:

TEST	**CO- MARK WISE DISTRIBUTION**						**BLOOM'S LEVEL MARK WISE DISTRIBUTION**					
AT-1	CO1	CO2	CO3	CO4	CO5	CO6	BTL1	BTL2	BTL3	BTL4	BTL5	BTL6
	30	30					14	46				
AT-2	CO1	CO2	CO3	CO4	CO5	CO6	BTL1	BTL2	BTL3	BTL4	BTL5	BTL6
			30	30			14	46				
MODEL	CO1	CO2	CO3	CO4	CO5	CO6	BTL1	BTL2	BTL3	BTL4	BTL5	BTL6
	20	20	20	20	10	10	10	90				

Prepared By

Verified By
(HOD)

Approved By
(PRINCIPAL)