SRINIVAS UNIVERSITY
INSTITUTE OF ENGINEERING & TECHNOLOGY
Department of Chemistry
TEACHING PLAN (ODD/EVEN Semester 2022- 2023)

Subject Code	22SES16/262	**Title**	Environmental Studies and Sustainable Development Goals (B Section)	**Class**	B.Tech. I Sem	**Mode of Delivery**	Classroom
Prerequisite	Basic of 1 to 12th Standard			**Program/Department**	Chemistry/Material Science		
Faculty Name/ Faculty Id /	Dr. Shubhrajyotsna Aithal			**Designation/Dept.**	Associate Professor		
Credits	2	**Hours/week**	**L-T-P: 1-0-1**	**CIE Marks**	50	**SEE Marks**	00	**Total Hours**	26

Course Objective:

1. Recognize major concepts in environmental sciences and demonstrate in-depth understanding of the environment.
2. Develop analytical skills, critical thinking, and demonstrate problem-solving skills using scientific techniques.
3. Understand and implement the concepts of sustainable development goals.

Course Outcome of the Course:

On Completion of this Course the Student was able to,

CO id	Course Outcome
CO1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale.
CO2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
CO3	Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components.
CO4	Develop and educate the surroundings on sustainable development goals How Green technology supports to achieve it
CO5	Individual & team contribution for realization of UNs SDG.

CO-PO Mapping with Attainment Level:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	Avg. % of attainment
CO1													
CO2													
CO3													
CO4													
CO5													
Expected Overall Average Course Outcome Attainment Level for this Course :													

Lesson/Teaching Plan of the Course:

Hour No.	Plan Date	Actual Date	Topic to be covered	PO Mapping	Knowledge Level	Pedagogy	Text/ Reference book
			Module –1 : Environment & Ecosystem				
01	22/11/22		**Session 1 :** Introduction: Environment - Components of Environment Ecosystem; Types & Structure of Ecosystem. Multiple Choice Questions Set-1				T1 & T2
02	25/11/22		**Session 2 :** Balanced ecosystem, Human Activities – Food, Shelter, and Economic & Social Security.				
03	29/11/22		**Session 3 :** Impacts of Agriculture & Housing, Impacts of Industry, Mining & Transportation.				
04	02/12/22		**Session 4 :** Environmental Impact Assessment, Sustainable Development.				
05	06/12/22		**Session 5 :** Multiple Choice Questions Set-1 (50 Questions)				
Verified by			HoD:		Dean:		
			Module – 2 : Natural Resources & Energy				
06	09/12/22		**Session 6 :** Natural Resources, Water resources – Availability & Quality aspects, Water borne diseases &water induced diseases, Fluoride problem in drinking water				
07	13/12/22		**Session 7 :** Mineral resources, Forest Wealth, Material Cycles – Carbon Cycle, Nitrogen Cycle & Sulphur Cycle.				
08	16/12/22		**Session 8 :** Energy – Different types of energy, Conventional sources & Non Conventional sources of energy, Solar energy, Hydro electric energy,				
09	20/12/22		**Session 9 :** Wind Energy, Nuclear energy, Biomass &Biogas Fossil Fuels, Hydrogen as an alternative energy.				
10	23/12/22		**Session 10 :** Multiple Choice Questions Set-2 (50 Questions)				
Verified by			HoD:		Dean:		
			Module -3 : Environmental Pollution & Management				
11	27/12/22		**Session 11 :** Environmental Pollution – Water Pollution, Noise pollution, Land Pollution,				
12	30/12/22		**Session 12 :** Public Health Aspects.				
13	03/01/23		**Session 13 :** Global Environmental Issues: Population Growth, Urbanization, Land Management,				
14	06/01/33		**Session 14 :** Water & Waste Water Management.				
15	13/01/23		**Session 15 :** Multiple Choice Questions Set-3 (50 Questions)				
Verified by			HoD:		Dean:		

			Module -4 : Global Warming & Solid Waste Management				
16	17/01/23		**Session 16 :** Air Pollution & Automobile Pollution: Definition, Effects – Global Warming, Acid rain.				
17	20/01/23		**Session 17 :** Ozone layer depletion, controlling measures.				
18	24/01/23		**Session 18 :** Solid Waste Management, E – Waste Management,				
19	27/01/23		**Session 19 :** Biomedical Waste Management -Sources, Characteristics & Disposal methods.				
20	31/01/23		**Session 20 :** Multiple Choice Questions Set-4 (50 Questions)				
Verified by			HoD:		Dean:		
			Module 5 : Sustainable development goals (SDGs), its importance, & realization possibility using Green technology				
21	03/02/23		**Session 21 :** Introduction to Sustainable development goals (SDGs) and its importance				
22	07/02/23		**Session 22 :** (1) No Poverty (2) Zero Hunger, (3) Good Health and Well-being, (4) Quality Education, (5) Gender Equality,				
23	14/02/23		**Session 23 :** (6) Clean Water and Sanitation, (7) Affordable and Clean Energy, (8) Decent Work and Economic Growth, (9) Industry, Innovation and Infrastructure, (10) Reducing Inequality,				
24	17/02/23		**Session 24 :** (11) Sustainable Cities and Communities (12) Responsible Consumption and Production, (13) Climate Action (14) Life Below Water (15) Life on Land				
25	21/02/23		**Session 25 :** (16) Peace and Justice Strong Institutions (17) Partnerships to achieve the Goal, Green technology & its contribution to achieve Sustainability.				
26	24/02/23		**Session 26 :** Multiple Choice Questions Set-4 (50 Questions)				
Verified by			HoD:		Dean:		

TEXT/REFERENCE BOOKS:

T/R	BOOK TITLE/AUTHORS/PUBLICATION
T1	1. Environmental Studies and Sustainable Development Goals By Dr. Shubhrajyotsna Aithal, Srinivas Publication, India 2021

T2	2. John R. Karsnitz, Stephen O'Brien and John P. Hutchinson, "Engineering Design", Cengage learning (International edition) Second Edition, 2013.
R1	3. R. J. Ranjit Daniels and Jagadish Krishnaswamy, "Environmental Studies", (2009), Wiley India Private Ltd., New Delhi.
R2	4. Raman Sivakumar, "Principals of Environmental Science and Engineering", (2005) Second Edition, Cengage learning Singapore,

Teaching Pedagogy:

A: Chalk & Talk using Board	B: Audio Visual Aids (Youtube materials)
C: Flipped Class Room Activity	D: Chalk & Talk using PPT
E: Group Discussion	F: Case Study
G: Group Activity	H: Brain Storming
I: Role Play	J: MCQ
K: Technical Debate	L: PPT, NPTEL Videos, etc.,

Attainment Matrix for CO-PO:

Sl. No	Attainment Range	Attainment Level
1	>= 75%	3
2	>=60% & <75%	2
3	>=50% & <60%	1

Note: Each Course Outcome (CO) may have equal weight-age in calculating the overall Attainment level of the Course else There may be a variation in the Contribution in attaining the desired level. For example, a faculty expert may assume CO4 and CO5 may contribute more comparatively to other Cos since both will deal with high order Knowledge Levels.

Contribution of Course Outcomes for calculating the Attainment Level:

Sl. No	Course Outcomes	% of Contributions
1	CO1	20
2	CO2	20
3	CO3	20
4	CO4	20
5	CO5	20

Assessment Pattern for measuring Acquired Knowledge Levels:

Blooms Knowledge Level	Type of Continuous Internal Assessments					Semester End Exam
	Written Test	MCQ	Mini-Project/Problem Solving/Case study	Assignments	Any other Activities	
Remember						05
Understand		02				05
Apply	03	04	02	03		15
Analyze	03	04	03	02		15
Evaluate	04		05	05		10
Create			05			0
Total	10	10	15	10	0	50

Formula for Calculating the Overall Course Attainment Level for a Course:

Overall Attainment = (0.8* Direct Measurement of COs in Continuous Internal Assessment) + (0.2* Measurement of COs in Semester End Exam)

Overall Course Outcome attainment level matrix (Maximum attainment level is 3):

Sl. No	Attainment Range	Attainment Level
1	>=2.75	Strong
2	>=2.0 & <2.75%	Medium
3	<2.0	Need to Improve

Overall Course Outcome attainment level is:

Remarks:

Course In-Charge **HOD**

Date: