



## C.U.SHAH UNIVERSITY – Wadhwan City

**FACULTY OF:** -Technology and Engineering (Diploma Engineering)

**DEPARTMENT OF:** - Humanities

**SEMESTER:** - I

**CODE:** - 2TE01ESE1

**NAME** – Environmental Science and Energy Management (ES & EM)

### Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
		Th	Tu	Pr	Total		Theory				Practical (Marks)			Total Marks
							Sessional Exam		University Exam		Internal		University	
							Marks	Hours	Marks	Hours	Pr	TW	Pr	
2TE01ESE1	Environmental Science and Energy Management	3	0	2	5	4	30	1.5	70	03	30	20	-----	150

### Objectives:-

- Environmental Sciences and its components.
- Ecology, Ecosystem and Biogeochemical cycles.
- Different types of environmental resources.
- Major Global Problems surrounding us.
- Different techniques and sources of energy demand management.

**Prerequisites:** - Components of environmental science, Ecological aspects of environment ,Natural resources,Basics about global environmental problems, Basic methods to manage and to conserve environmental energy.

### Course Outlines:-

Sr. No.	Course Contents	Hours
1	<b>Environmental Science :</b> Introduction, Environment, Environmental Engineering Factors of Environment Component parts of Physical Environment, Environmental Education, Public Awareness For Environment, Protection and Its Necessity, Slogans For Environmental protection	3
2	<b>Ecosystem of Environment :</b> Introduction of Ecology, Meaning and Some Basic Definitions, Basic Idea and Component of Ecosystem, Food Chain, Ecosystem : Classification, Factors Affecting It, Complete and In-Complete Ecosystem, Ecological and Ecological Pyramids and Defects In Pyramid, Biogeochemical Cycles: Hydrologic Cycle, Carbon Cycle, Nitrogen Cycle, Phosphorus Cycle, Sulphur Cycle Biodiversity – Meaning and Explanation, Main Factors Cause Rapid Decrease In Biodiversity	10
3	<b>Environmental Resources :</b> Introduction, Various Types Of Environmental Resources, Classification, Characteristic and Uses of Environmental Resources, Water Wealth : Sources of Water – Surface and Subsurface Sources, Forest Resource : Forest and Environment, Deforestation – Reasons Afforestation - Forest Conservation, Remote Sensing : Three Factors of Remote Sensing – Explanation With Chart, Use of Remote Sensing, Land : Types of Land Based on Area – Wet, Waste and Desert, Uses and Abuses Of Land, Reason For Abuses of Land	8

4	<b>Global Environmental Problems :</b> Introduction- Major Global Problems - Acid Rain, Green House Effect, and Depletion of Ozone Layer, Global Warming, Acid Rain : Explanation of Acid Rain, Sources of Acid Rain, Effect of Acid Rain, Green House Effect: Basic Introduction and Explanation, Types of Green House Gases , Effect of Green House Effects, Depletion of Ozone Layer: Basic Idea , Combustion of Chemical With Ozone Layer, Introduce C.F.C., Uses of C.F.C. Effect of Ozone Layer Depletion, Steps to Protect It, Global Warming : Introduction of Global Warming, Measures Against Global Warming	9
<b>Energy Management</b>		
5	<b>Renewable Sources Of Energy :</b> Introduction - Definition of Energy and Energy Management, Forms of Energy, Sources and Utilization, Energy Management For Renewable Sources, Limitations of Renewable Sources, Introduce Conventional and Non-Conventional Sources, Distinction Between Them, Comparison of Conventional and Renewable Sources	4
6	<b>Solar Energy :</b> Introduction, Solar Constant, Solar Radiation at Earth's Surface, Basis Ideao Instruments Measuring Radiation and Radiation Parameter, Photovoltaic Conversion , Its Advantages, Semiconductor and P-N Junction, Solar Cell, Photovoltaic Application, Solar Collectors : Principle, Efficiency, Advantages, Solar Pond, Solar Furnace, Solar Energy Application : Thermal Application – Solar Water Heater, Solar Cooker, Community, Solar Cooker, Solar Dryer	10
7	<b>Wind Energy And Bio–Mass Energy :</b> Introduction- Wind Measurement , Wind Power- Its Advantages and Disadvantages, Classification of Wind Energy Conservation System, Windmills : Introduction and Classification – Horizontal and Vertical, State Their Sub Classification and Explain Classification of Horizontal Wind Mills, Site Selection For Wind Mills, Applications of Windmill System, Bio-Mass Energy – Introduction, Photosynthesis, Biogas, and Biogas Plant, Classification of Biogas Plants, Principle and Working of Fixed-Dome Type Biogas Plant, Site Selection For Biogas Plant, Size of Biogas Plant, Advantages and Disadvantages of Bio-Mass Energy	12
8	<b>Energy Conservation And Management :</b> Introduction, Energy Conservation Measures Smokeless Stoves ( Nirdhoom Chulhas), Its Advantages, Conservation of Energy In Domestic Appliances and In Boiler, Energy Management: In Electric Lighting, In Transportation, Power Plant, Industries.	4

### List of Experiments:-

- To Study Biomass Energy by Photosynthesis Technique.
- To Study Conservation of Energy by Dutch-Type Wind Mill.
- To Study Conservation of Energy by Solar Furnace.
- To Study Conservation of Energy by Smokeless Stoves.
- To Study Management of Energy by Solar Cell.
- To Study Management of Energy by Dome-Typed Biogas Plant.
- To Study Conservation of Energy by Flat Plate Collector.

- To Study P-N Junction Diode In Solar Cell To Conserve Energy.

**Learning Outcomes:-**

- Awareness About Environmental Science and Necessity of It.
- Basic Idea About Ecology and Ecosystem With Classification and Model
- Food Chain and Biogeochemical Cycles
- Comprehend Biodiversity
- Various Types of Environmental Resources, Its Characteristics and Uses.
- Comprehend The Major Global Environment Problems and Steps To Reduce Them.
- Introducing Renewable Sources of Energy.
- Energy Conservation and Energy Management by Different Types of Energy Resources.

**Books Recommended:-**

- *Solar Energy Utilization*, **G.D. Rai**, Khanna Publishers, Delhi
- *Biogas Technology*, **K.C. Khandelwal, S.S.Mahdi**, Tata MGH
- *Energy resources and supply*, **John Willy & sons**, New York
- *Principles of energy conservation*, **A.W. Culp**, Tata MGH