

GOVERNMENT POLYTECHNIC, JAJPUR

A/P: Ragadi, Block: Korei, Dist.: Jajpur, Odisha-755019

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Discipline: Math & Science	Semester: 1st	Name of the Teaching faculty: SUCHETA DHAL	
Subject: Environmental Science	No of Days/Week Class allotted: 4	From: 6/08/2025	To: 4/12/2025
		No. of week: 15	
Week	Class Day	Topic	
1st	1st	Structure of ecosystem,	
	2nd	Biotic & Abiotic components	
	3rd	Food chain and food web	
	4th	Aquatic (Lentic and Lotic) and terrestrial ecosystem	
2nd	1st	Carbon cycle,	
	2nd	Nitrogen cycle	
	3rd	Sulphur cycle,	
	4th	Phosphorus cycle.	
3rd	1st	Global warming -Causes, effects, process	
	2nd	Green House Effect,	
	3rd	Ozone depletion	
	4th	Quiz Test & Question Answer Discussion	
4th	1st	Definition of pollution and pollutant,	
	2nd	Natural and man made sources of air pollution	
	3rd	Types of Air Pollutants; Types of Particulate Pollutants.	
	4th	Effects of Particulate Pollutants.	
5th	1st	Class Test	
	2nd	Effects and control of Particulate Pollutants - Bag filter (Types of Bag filters)	
	3rd	Effects and control of Particulate Pollutants - Cyclone Separator,	
	4th	Effects and control of Particulate Pollutants - Electrostatic Precipitator.	
6th	1st	Gaseous Pollution Control: Absorber	
	2nd	Gaseous Pollution Control: Catalytic Converter,	
	3rd	Effects of air pollution due to Refrigerants, I.C., Boiler	
	4th	Noise Pollution meaning; Sources of Noise Pollution	
7th	1st	Measurement of pollution level; Sound Level Meter	
	2nd	Effects of Noise pollution; Noise pollution (Regulation and Control) Rules, 2000	
	3rd	Quiz Test & Question Answer Discussion	
	4th	Sources of water pollution; Types of water pollutants	
8th	1st	Characteristics of water pollutants- Turbidity, pH, total suspended solids, total solids	
	2nd	BOD and COD: Definition, calculation	
	3rd	Waste Water Treatment: Primary methods: sedimentation, froth floatation,	
	4th	Waste Water Treatment: Secondary methods: Activated sludge treatment, Trickling filter, Bioreactor,	
9th	1st	Waste Water Treatment: Tertiary Method: Membrane separation technology, RO (reverse osmosis).	
	2nd	Causes, Effects and Preventive measures of Soil Pollution: Causes-Excessive use of Fertilizers, Pesticides and Insecticides, Irrigation, E-Waste.	
	3rd	Class Test	
	4th	Solar Energy: Basics of Solar energy. Flat plate collector (Liquid & Air).	

10th	1st	Theory of flat plate collector.
	2nd	Importance of coating. Advanced collector.
	3rd	Solar pond. Solar water heater,
	4th	Solar dryer; Solar stills.
11th	1st	Biomass: Overview of biomass as energy source. Thermal characteristics of biomass as fuel.
	2nd	Anaerobic digestion. Biogas production mechanism
	3rd	Utilization and storage of biogas.
	4th	Wind energy: Current status and future prospects of wind energy. Wind energy in India.
12th	1st	Environmental benefits and problem of wind energy.
	2nd	New Energy Sources: Need of new sources. Different types new energy sources.
	3rd	Applications of (Hydrogen energy, Ocean energy resources, Tidal energy conversion.)
	4th	Concept, origin and power plants of geothermal energy
13th	1st	Class Test
	2nd	Sources and characteristics of : Municipal solid waste,
	3rd	Sources and characteristics of : E- waste, bio- waste.
	4th	Metallic wastes and Non-Metallic wastes (lubricants, plastics, rubber) from industries.
14th	1st	Collection and disposal: MSW (3R, principles, energy recovery, sanitary landfill),
	2nd	Collection and disposal: Hazardous waste
	3rd	Air quality act 2004, Air pollution control act 1981
	4th	water pollution and control act 1996.
15th	1st	Structure and role of Central pollution control board.
	2nd	Structure and role of State pollution control board.
	3rd	Concept of Carbon Credit, Carbon Footprint
	4th	Environmental management in fabrication industry. ISO14000: Implementation in industries, Benefits.

References/Suggested Learning Resources:

1. Environmental Science (English) by Dr. Subrat Roy (Download from <https://ekumbh.aicte-india.org/dbook.php>)
2. S.C. Sharma & M.P. Poonia, Environmental Studies, Khanna Publishing House, New Delhi
3. C.N. R. Rao, Understanding Chemistry, Universities Press (India) Pvt. Ltd., 2011.
4. Arceivala, Soli Asolekar, Shyam, Waste Water Treatment for Pollution Control and Reuse, Mc-Graw Hill Education India Pvt. Ltd., New York, 2007, ISBN:978-07-062099-
5. Nazaroff, William, Cohen, Lisa, Environmental Engineering Science, Wiley, New York, 2000, ISBN 10: 0471144940.
6. O.P. Gupta, Elements of Environmental Pollution Control, Khanna Publishing House, New Delhi
7. Rao, C. S., Environmental Pollution Control and Engineering, New Age International Publication, 2007, ISBN: 81-224-1835-X.
8. Rao, M. N. Rao, H.V.N, Air Pollution, Tata Mc-Graw Hill Publication, New delhi, 1988, ISBN: 0-07- 451871-8.
9. Frank Kreith, Jan F Kreider, Principles of Solar Engineering, McGraw-Hill, New York ; 1978, ISBN: 9780070354760.
10. Aldo Vieira, Da Rosa, Fundamentals of renewable energy processes, Academic Press Oxford, UK; 2013. ISBN: 9780123978257.
11. Patvardhan, A.D, Industrial Solid Waste, Teri Press, New Delhi, 2013, ISBN:978-81-7993-502-6
12. Metcalf & Eddy, Waste Water Engineering, Mc-Graw Hill, New York, 2013, ISBN: 077441206.
13. Keshav Kant, Air Pollution & Control, Khanna Publishing House, New Delhi (Edition 2018)

(b) Open source software and website address:

- 1) www.eco-prayer.org
- 2) www.teriin.org
- 3) www.cpcp.nic.in
- 4) www.cpcp.gov.in
- 5) www.indiaenvironmentportal.org.in
- 6) www.whatis.techtarget.com
- 7) www.sustainabledevelopment.un.org
- 8) www.conserve-energy-future.com

Sucheta Shal
Signature of the faculty
18/07/2025