

LESSON PLAN

Name of the Faculty: Dr. Sushma

Discipline: M.Sc. Environmental Science

Semester: Third

Subject: Industrial Water and Wastewater Treatment

Lesson plan duration: 12 weeks

Week	Theory	
	Lecture day	Topic
1	1.	Types of industrial wastewater pollutants,
	2.	Industrial wastewater characterization,
	3.	Classification of industries into green, orange and red,
	4.	Standards of disposal for industrial wastes, MINAS,
2	5.	Industrial Estate planning, CETP
	6.	Requirement and objectives of CETP,
	7.	Planning and management of CETP facilities for small-scale industries.
	8.	General steps for the treatment of industrial wastewater: equalization, neutralization,
3	9.	Sedimentation,
	10.	Oil Separation,
	11.	Flotation,
	12.	Coagulation
4	13.	Biological oxidation - removal of organics: sorption
	14.	Stripping
	15.	Biodegradation
	16.	Nutrient removal – nitrification,
5	17.	denitrification,
	18.	ANAMMOX,
	19.	SHARON,
	20.	CANON process;
6	21.	Biological phosphate removal (BPR);
	22.	Fundamentals of Membrane processes;
	23.	Types and classification of membranes;
	24.	Advanced oxidation process and its application for wastewater treatment
7	25.	Photocatalysis,
	26.	ozonation
	27.	High Rate Technologies for industrial wastewater Treatment: Bioreactors for wastewater treatment -
	28.	Membrane bioreactors (MBR)
8.	29.	Moving Bed Biological Reactors (MBBR)
	30.	Anaerobic Baffled Reactor (ABR)
	31.	Natural systems for the management of Industrial wastewater
	32.	Constructed Wetland

9.	33.	Duckweed ponds
	34.	Reed Bed system
	35.	Waste stabilization ponds
	36.	Others; Energy recovery from wastewater;
10	37.	Sludge management.
	38.	Zero liquid discharge concept in Industries.
	39.	Manufacturing process,
	40.	Waste/emission generation sources,
11	41.	Waste characteristics, Effluent Treatment, reuse and recovery of resources from (1) Textile Industries
	42.	(2) Distilleries
	43.	(3) Sugar
	44.	(4) Paper and Pulp mills
12	45.	(5) Tanneries
	46.	(6) Food Processing industries
	47.	(7) Fertilizer Industry
	48.	(8) Mining industries
	49.	(9) Petroleum industries