SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Department of Civil Engineering			LP: CE18413
B.E	: Civil Engineering	Regulation:2018	Rev. No: 00
PG Specialisation	: NA		Date: 28/02/2022
Sub. Code / Sub. Name	: VD18413/WASTEWATER TREATMENT TECHNIQUES		

Unit Syllabus: Domestic Wastewater Treatment, - Wastewater characteristics; Primary, secondary and tertiary treatment Physical Unit Processes: Screening; Commutation; Grit Removal; Equalization; Sedimentation – Biological Unit Processes - Aerobic vs. anaerobic processes - Aerobic treatment; Suspended growth aerobic treatment processes; Activated sludge process and its modifications; Attached growth aerobic processes; Tricking filter sand Rotating biological contactors - Anaerobic treatment; suspended growth, attached growth, fluidized bed and sludge blanket systems; Industrial Wastewater treatment- nitrification, denitrification; Phosphorus removal, – Heavy metal removal – Membrane Separation Process – Air Stripping and Absorption Processes - Sludge Treatment - Characteristics of sewage sludge- Sludge thickening, sludge digestion, dewatering, drying, Aerobic sludge stabilization- Anaerobic stabilization of sludge and Composting - Water Treatment Plant Characteristics, Plant layout -Operations and maintenance of Treatment plants, Trouble Shooting, - Filtration ,Softening of Water, Defluoridation, Removal of Odors -Treated Municipal Wastewater Discharge Systems, Post treatment techniques - Visit to a municipal wastewater treatment plant and a small plan

Objective: To give sound knowledge on waste water treatment techniques with basic understanding of waste water.

Session No *	Topics to be covered	Ref	Teaching Aids
01	Introduction to Waste water :Different Sources of waste water	T2 Page No.1 to 6	BB,PPT
02	Characteristics of waste water	T2 Page No.20 to 35	BB,PPT
03	Primary, secondary and tertiary treatment	T2 Page No.243 - 250	BB,PPT
04	Primary treatment - Physical Unit Processes: Screening; Commutation;	T2 Page No.250 - 253	BB,PPT
05	Grit Removal; Equalization;basin	T2 Page No.253 - 257	BB,PPT
06	Sedimentation – Biological Unit Processes - Aerobic vs. anaerobic processes	T2 Page No.36 to 73	BB,PPT

07	Aerobic treatment; Suspended growth aerobic treatment processes;	T2- Page No.127 to 146	BB,PPT
08	Activated sludge process and its modifications	T2 -Page No.466 to 470	BB,PPT
09	Attached growth aerobic processes	.T2 -Page No 470 to 472	BB,PPT
10	Tricking filter sand Rotating biological contactors -	T2 -Page No.470 to 475	BB,PPT
11	Anaerobic treatment; suspended growth, attached growth,	T2 -Page No.476 to 478	BB,PPT
12	Fluidized bed and sludge blanket systems;	T2 -Page No.477 to 479	BB,PPT
13	Industrial Wastewater treatment- nitrification, denitrification;Phosphorus	T2 -Page No.480 to 482	BB,PPT
14	Industrial Wastewater treatment- denitrification; Phosphorus removal	T2 -Page No.506 to 517	BB,PPT
15	Heavy metal removal	T2 -Page No.518 to 525	BB,PPT
	CAT - 1		
16	Membrane Separation Process	T2 -Page No.526 to 527	BB,PPT
17	Air Stripping and Absorption Processes	T2 -Page No.529 to 533	BB,PPT
18	Sludge Treatment	T2 Page No. 278 - 282	BB,PPT
19	Characteristics of sewage sludge-	T2 Page No. 272 - 275	BB,PPT
20	Sludge thickening,	T2 Page No.353	BB,PPT
21	Sludge digestion, dewatering, drying,	T2 Page No.322 - 324 T2 Page No.333 - 337	BB,PPT
22	Aerobic sludge stabilization-	T2 Page No.343 - 344	BB,PPT
23	Anaerobic stabilization of sludge and Composting	T2 Page No.345 - 346	BB,PPT
24	Water Treatment Plant Characteristics,	T1 – Page No 213 - 219	BB,PPT
25	Water Treatment Plant layout	T1 – Page No 220 - 222	BB,PPT

26	Operations and maintenance of Treatment plants	T1 – Page No 223 - 227	BB,PPT
27	Treatment plants- Trouble Shooting.	T1 – Page No 228 - 230	BB,PPT
28	Filtration, Softening of Water, Defluoridation, Removal of Odors	T1 – Page No 508 - 524	BB,PPT
29	Treated Municipal Wastewater Discharge Systems, Post treatment techniques	T1 – Page No 610 - 625	BB,PPT
30	Visit to a municipal wastewater treatment plant and a small plant.	-	-
	CAT - 2		

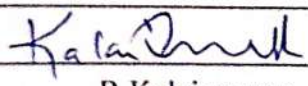
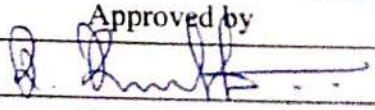
* Session duration: 50 minutes

TEXT BOOKS:

1. Garg, S.K., "Environmental Engineering - I ", Khanna Publishers, New Delhi, 2013
2. Garg, S.K., "Environmental Engineering - II", Khanna Publishers, New Delhi, 2013
3. Modi, P.N., "Environmental Engineering I & II", Standard Book House, Delhi, 2012

REFERENCES:

1. Manual on Water Supply and Treatment, CPHEEO, Government of India, New Delhi, 1999
2. Hand book on Water Supply and Drainage, SP35, B.I.S., New Delhi, 1987
3. Metcalf and Eddy, M.C., "Wastewater Engineering – Treatment & Reuse", Tata McGraw-Hill Publications, New Delhi, 2003.
4.Syed R. Qasim and Edward M. Motley Guang Zhu, "Water Works Engineering Planning", Design and Operation, Prentice Hall of India Private Limited, New Delhi, 2009.

	Prepared by	Approved by
Signature		
Name	R.Kalaivannan	Dr. R.Kumutha
Designation	Assistant Professor	Professor and Head of the Department
Date	28/02/2022	28/02/2022
Remarks *:		
Remarks *:		

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD