

DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE (AUTONOMOUS)

PERAMBALUR-621212

LABORATORY COURSE PLAN

COURSE INFORMATION:

LAB COURSE TITLE	ENVIRONMENTAL ENGINEERING LABORATORY			
LAB COURSE CODE	U23CEP41			
LAB COURSE STRUCTURE	LECTURE	TUTORIAL	PRACTICAL	CREDIT
	0	0	4	2
REGULATION	BRANCH	YEAR	SEMESTER	ACADEMIC YEAR
2023	CIVIL	II	IV	2025-2026
COURSE INCHARGE				

SYLLABUS

COURSE OBJECTIVES:

The student should be made:

- ❖ To Study the water contamination
- ❖ To study quality characteristics of portable and palatable water
- ❖ To analyse the impact of contaminated water
- ❖ To understand the importance of DO
- ❖ To understand the sampling and preservation methods and significance of
- ❖ characterization of wastewater

LIST OF EXPERIMENTS

1. Determination of PH and turbidity in wastewater.
2. Determination of Hardness in wastewater.
3. Determination of Ammonia Nitrogen in wastewater.
4. Determination of residual chlorine
5. Determination of Optimum Coagulant Dosage
6. Determination of suspended, volatile, and fixed solids
7. Determination of dissolved oxygen
8. Determination of B.O.D. test

9. Determination of C.O.D. test

10. Introduction to Bacteriological Analysis (Demonstration only)

TOTAL: 60 PERIODS

REFERENCE BOOKS:

R1: Standards Methods for the Examination of Water and Wastewater, Seventh Edition, WPCF, APHA and AWWA, USA, 1989

EXP. NO.	NAME OF THE EXPERIMENTS	NO. OF PERIODS	CUMULATIVE PERIODS
CYCLE I			
1	PH and turbidity test	6	6
2	Hardness test	6	12
3	Ammonia Nitrogen test	6	18
4	Residual chlorine test	6	24
5	Optimum Coagulant Dosage test	6	30
CYCLE II			
6	Suspended, volatile, and fixed solids test	6	36
7	C.O.D. test	8	44
8	Dissolved oxygen test	6	50
9	B.O.D. test	7	57
10	Bacteriological Analysis test	3	60

COURSE OUTCOMES

At the end of the course, the student should be able to:

- CO1 :** Characterize portable water and conduct treatability studies
- CO2 :** Characterize wastewater and conduct treatability studies
- CO3:** Understand the drinking water characteristics
- CO4:** Understand the importance of wastewater treatment
- CO5:** Study about impact of B.O.D and C.O.D
- CO6:** Study about the importance of physical characteristics of water.

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	3	3	3	2		2	3		2	2	2	3	2	2
CO2	3	3	3	2	3	2	3		2	2	2	3	2	2
CO 3	3			2	3	2	3		2	2	2	3	2	2
CO 4	3			2		2	3		2	2		3	2	2
CO 5	3	3	3	2		2	3		2	2	2	3	2	2
CO6	3	3	2	2		2	3		2	2	2	2	2	2
AVG	3	3	3	2	3	2	3	-	2	2	2	3	2	2

ADDITIONAL EXPERIMENTS		
EXP. NO.	NAME OF THE EXPERIMENTS	Identified Resource link
1	Iron and fluoride test	https://ee2-nitk.vlabs.ac.in/exp/flouride-in-water/theory.html
2	Oil and Grease test	https://maineenvironmentallaboratory.com/?p=1127
3	Phosphates and Sulphates	https://www.h2olabcheck.com/blog/view/phosphate

MODEL LAB DETAILS

BATCH	REGISTER NO.	MODEL OF LAB CONDUCT	DATE	TIMINGS
I		OFFLINE		9.30 PM-12.30 PM
II		OFFLINE		1.30 PM-4.30 PM

LIST OF QUESTIONS:

1. Importance of pH for designing of hydraulic structures.
2. Effect of pH on structures? Define Abram's water cement law.
3. Why does the pH change on aerating the water?
4. For efficient coagulation the water must be alkaline. Why?
5. Why do we use CO₂ free distilled water for analysis?
6. What is the limit of chlorides in drinking water as per IS code ?
7. List out the material contributed towards alkalinity?
8. Explain chloride test?
9. Explain about effect of chloride presence in water?
10. Explain turbidity test?
11. How to measure turbidity of water?
12. What is coagulant ? Explain with example?
13. What is the use of chlorine?
14. How to determine the total solids in water?
15. Explain BOD test?
16. Explain COD test?
17. What is the acceptable PH value of water?
18. Potable water means?
19. Hardness of water caused due to presence of which material?
20. Effect of fluoride presence in water?

VIVA QUESTIONS:

1. What is pH?
2. PH determination is important for civil engineering constructions. How?
3. What is the role of pH in coagulation and flocculation?
4. Which is the major form of alkalinity? How is it formed?
5. What is excess alkalinity? How do you express it?
6. Why do we take 0.02 N H₂SO₄ for the titration?
7. The water where algae are flourishing is alkaline. Why? Will there be diurnal variation in pH?
8. Why Silver nitrate is stored in a brown bottle?
9. What is The pore size of the filter paper used for filtration ?
10. The type of crucible used for the experiment is made of which material?
11. What is reagent?
12. Explain acidity test?

13. What are the types of acidity test?
14. Explain alkaline test?
15. How to determine total fixed and volatile solids?
16. What is residual chlorine?
17. Explain about suspended and fixed solids in wastewater.
18. List out the experiments on water?
19. What are the chemicals used in waste water laboratory?
20. Mercury Sulphate is added to reduce the interference of Hardness. Is it correct?