KAE 346/2- Pollution and Environmental Chemistry Practical

Course Objective: To acquire practical skill in carrying out measurement of pollution and environmental chemical parameters.

Experiment title	**Content**	**Number of laboratory hours**	**Expected outcome – upon completion of these experiments, the student should be able to:**
1. Atomic Absorption Spectroscopy (AAS)	• Determination of lead in soil samples	3	• Perform sample preparation for the determination of lead in soil samples. • Carry out analysis of soil samples using AAS. • Operate atomic absorption spectrometer.
2. Chemical Oxygen Demand (COD)	• Determination of COD of a water sample	3	• Carry out the determination of COD.
3. Total Kjeldahl Nitrogen Content.	• Determination of total Kjeldahl nitrogen (TKN): ammoniacal nitrogen and organic nitrogen	3	• Carry out the determination of TKN.
4. Phosphates.	• Determination of phosphates: orthophosphates	3	• Carry out the determination of orthophosphates using ultraviolet/visible spectrophotometry.
5. Biochemical Oxygen Demand (BOD)	• Determination of BOD of a lake water sample	3	• Carry out the determination of BOD and dissolved oxygen.

Experiment title	Content	Number of laboratory hours	Expected outcome – upon completion of these experiments, the student should be able to:
6. Coagulation and Jar Test.	• Determination of dosage of coagulant (alum) for the treatment of wastewater • Determination of the effect of pH on coagulation in the treatment of industrial wastewater	3	• Carry out the Jar test. • Know the factors which influence coagulation.
7. Treatment of Heavy Metals in Wastewater by Hydroxide Precipitation	• Optimization of pH for precipitation of hydroxides of chromium and zinc	3	• Understand effect of pH on the precipitation of metal hydroxides. • Carry out the treatment of heavy metals in wastewater samples by hydroxide precipitation.
8. Dissolved and Suspended Solids in Industrial Wastewater	• Determination of chromium and zinc in industrial wastewater samples: dissolved metals and metals in suspended solids	3	• Carry out the determination of total chromium and zinc. • Carry out the determination of dissolved chromium and zinc in wastewater samples. • Carry out the determination of chromium and zinc in suspended solids.
9. Adsorption Processes with Activated Carbon	• Determination of the effect of pH on the adsorption of textile dyes on activated carbon • Determination of the equilibrium time for adsorption • Determination of the adsorption isotherms	3	• Understand the effect of pH on adsorption. • Determine the time for adsorption to attain equilibrium. • Know various adsorption isotherms and their importance.
	TOTAL	**27**	