GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Semester: 1

Master of Environmental Engineering

Subject Name ENVIRONMENTAL CHEMISTRY

Sr.No	Course content
1	**Basic Concepts of General Chemistry :**Fundamentals of atoms, molecules elements, Valancies, Nomenclatures; Chemical and oxidation reduction equations, Gas diagrams.Equilibrium constants and constants of Ionization, Activities and Solubility. pH, pX concepts and Logarithmatic concentration diagrams.
2	**Basic Concepts of Physical Chemistry :**Thermodynamics and chemical equilibrium relationship. Vapour pressures of liquids, Osmosis, Dialysis. Solvent extraction electrochemistry, Chemical kinetics.
3	**Basic Concepts of Organic Chemistry :**Sources and properties of organic chemical compounds, Trade organics, Soap and detergents, Pesticides.
4	**Soil Environmental Chemistry :**Soil and agriculture, Nature and composition of soil, Acit-base and ion exchange reactions in soil macronutrients in soil, Fertilizers, Wastes and pollutants in soil, Soil loss and degradation, Genetic engineering and agriculture, Agriculture and health, Agricultural pollution and its control.
5	**Methods of Chhemical Analysis** Analysis applicable to water , waste water and Air quality principles of analysis of gravimetric , Volumetric , Colorimetric, photoelectric , Polarographic and Gas Ghromotographic methods: Applications of above analysiss methods for testing of Turbidity,colour , pH, acidity , alkalinity, Hardness , Dissolved Oxygen, Biochemical Oxygen Demand , Nitrogenous compouns, Sulphorous compounds, Volatile acids .

List of Experiments:

1. Water and Waste Water Sampling , Preservation and storage . Exposure Integrated , Composite and grab sampling techniques and instrumentation
2. Gravimetric Analysis : (a) Total solids (b) Sulphate determination
3. Volumetric Analysis of water and Waste water (a) Acidity , Alkalinity , Hardness : total and Calcium hardness (c) Chloride and the like
4. Colourimetric Analysis : (a) pH(b) Fluoride, (c) Chlorine etc.
5. Potentiometric Analysis
6. ElectroChemical analysis
7. Determination of parameters of major chemical parameters like Nitrogen compounds , Phosphorous compounds
8. Determination of Importance parameters of Sludge and soil
9. All Experiments needed and available for Soil Chemistry

Reference Books:

(i) Chemistry for Environmental Engineering by C.N. Swayer and P.L. McCarty – McGraw Hill Book Co. – 3rd Edition

(ii) Standard Methods of Testing of Water and Wastewater Use by APHA, AWWA, AND WPCF (USA) – Latest Edition

(iii) Physico Chemical Examination of Water Sewage and Industrial Effluents, Pragati Prakashan, Meerut, India

(iv) Fundamental of environmental Chemistry by Stanley E. Mahajan – Lewis Publishers