

GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma in Environmental Engineering

Semester: 3

Subject Code

Subject Name ENVIRONMENTAL SCIENCE

Sr. No.	Course content
1.	FAMILIARIZATION OF INSTRUMENTS & LABORATORY WARES : 1.1 Laboratory wares 1.1.1 Types and Uses 1.1.2 Cleaning solutions 1.1.3 Method of Cleaning laboratory wares 1.1.4 Calibration of laboratory wares and its importance 1.2 Instruments used in Environmental Engg. Field. 1.2.1 Types 1.2.2 Uses and Importance of instruments. 1.2.3 Calibration of instruments.
2.	REAGENT WATERS : 2.1 Distilled water & demineralized water 2.2 Methods of preparing distilled water 2.3 Comparison of methods
3.	PREPARATION OF STANDARD SOLUTIONS : 3.1 Relationship of atomic, molecular & equivalent weights 3.2 Molar solution, Molal solution. Normal solution 3.3 Primary standards & secondary standards 3.4 Stock solutions & standard solutions 3.5 Standardization of solutions
4.	QUANTITATIVE & QUALITATIVE ANALYSES : 4.1 Importance of Quantitative measures in Environmental Engineering practice 4.2 Character of Environmental Engineering problems 4.3 Standard methods of analysis 4.4 Expression of results 4.5 Gravimetric analysis 4.6 Volumetric analysis 4.7 Colorimetry
5.	GENERAL CHEMISTRY : 5.1 Gas Laws. 5.1.1 Boyle's Law. 5.1.2 Charle's Law 5.1.3 Generalized Gas Law

	5.1.4 Dalton's Law 5.1.5 Henry's Law 5.1.6 Graham's Law 5.1.7 Gay-Lussac's Law
6.	ANALYSIS OF WATER PARAMETERS : 6.1 pH 6.2 Alkalinity. 6.3 Chloride. 6.4 Hardness. 6.5 Fluorides. 6.6 Solids 6.7 Turbidity. 6.8 Sulphate.
7.	ANALYSES OF WASTE WATER PARAMETERS : 7.1 Dissolve Oxygen 7.2 Chemical Oxygen Demand (COD) 7.3 Biochemical Oxygen Demand (BOD) 7.4 Oil & Grease. 7.5 Other Waste water parameters.

LABORATORY EXPERIENCES/ TERM WORK :

Sr. No.	Course content
1.	Familiarization of Laboratory and Calibration of Instruments & Glass wares
2.	Preparation of primary standards like, (i) 0.25 N $K_2Cr_2O_7$ (ii) 0.1M $CaCO_3$ (iii) 0.0282 N NaCl (iv) 0.02 N Na_2CO_3 Preparation of secondary standards like, (i) 0.25 N FAS (ii) 0.1M EDTA (iii) 0.0282 N $AgNO_3$ (iv) 0.02 N H_2SO_4 (v) 0.02 N NaOH Standardization of primary standards and secondary standards
3.	Determination of pH of water and waste water samples
4.	Determination of Turbidity of water samples
5.	GRAVIMETRIC ANALYSIS: a) Determination of Solids of water and waste water samples b) Determination of Sulphate of water and waste water samples c) Determination of Oil and Grease of waste water samples
6.	VOLUMETRIC ANALYSIS: a) Determination of Alkalinity of water samples b) Determination of Chloride of water and waste water samples

	c) Determination of Hardness of water samples d) Introduction of Chemical Oxygen Demand (COD) and Biochemical Oxygen Demand (BOD) of waste water samples
7.	Determination of Fluoride of water samples

REFERENCE BOOKS :

1. Environmental Chemistry by B.K.Sharma S.H.Kaur Goel Publishing House, Meerut, 1992.
2. Environmental Chemistry, A.K.De.,New Age Intl. pub Co,New Delhi, 1990
3. Chemistry for Environmental Engineering,C.N.Sawyer and P L Mc Carty, Mc Graw Hill Ltd.,
4. Standard Methods.
5. Ecology & Environment, P. D. Sharma, Ashish publications, 1994.
6. Relevant BIS codes