

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Semester: II Environmental Management

Subject Name Environmental Monitoring & Statistics

Sr.No	Course content
1.	Environmental Monitoring: Purpose of monitoring, Scales of observation, Environmental characteristics, Representative units, Sampling Location, Types of environmental monitoring, Sampling plan, Analytical data quality requirements: Precision and Accuracy, Detection limits, Reporting data
2.	Statistics in Environmental Monitoring Samples & Population : Random Sampling, Sample support, Frequency Distribution & Probability Density Function : Mean , Variance , Standard Deviation , Gaussian Variable, Sample size & Confidence interval, Co variance & Correlation, Liner Regression, Interpolation & Spatial Distribution
3.	Water Quality Monitoring Sampling techniques, Preservation of water sample, Physical Properties of water & its monitoring: Temperature, Conductivity, Turbidity etc., Chemical Properties of water & its monitoring 1. Electrometric method: pH 2. Colorimetric method 3. Spectroscopy method, Standardization & calibration of monitoring instruments.
4.	Air Quality Monitoring Type of Air Quality monitoring - Ambient Air Quality monitoring , Source Air Quality monitoring, Ambient Air Quality Monitoring- Selection of monitoring sites , Sampling time, Frequency & mode of sampling, Source Air Quality Monitoring – Type of Monitoring procedure.
5.	Environmental Microbial Properties & Processes Benefits of environmental microbes, Microorganism in soil, Sampling procedure for microbial characterization, Methods for characterizing microorganisms & microbial properties in water & soil.
6.	Map, GIS & Remote Sensing in Environmental Monitoring Maps:- Principals of mapping, Location and Land – Partitioning systems, topographic maps, Global positioning systems, Geographic Information System(GIS):- GIS and Geographic Information Systems Data, Remote Sensing: Physical Principles of Remote Sensing, optical properties of earth surface materials, remote sensing at landscape scale, applications of remote sensing in environmental health & toxicology
7.	Physical, Chemical and Microbial contaminants

	Physical contaminants – Naturally occurring particulates, Human made particulates, Mechanisms and control of particulate, Chemical contaminant:- Type of contaminants, Sources of Contaminants, contaminant transport and fate, Microbial contaminants:- Environmentally transmitted pathogens, concept of indicator organisms, sample processing and storage.
8.	Surface Water and Ground Water Monitoring Surface Water Monitoring:-Water Quality parameters, sampling the waters, Water sampling equipments, Ground Water Monitoring: - Objectives, Location of monitor wells, well construction, Design and Execution of ground water sampling programs.

Term work:

Term work will comprise of assignments on the questions related to environmental characteristics, sampling locations, types of environmental monitoring, detection limits, numericals on statistics in environmental monitoring, water quality monitoring, Air quality monitoring, map, GIS, and Remote Sensing in Environmental Monitoring, physical, chemical and microbial contaminants, surface water monitoring and ground water monitoring.

Reference Books:

- 1) .Environmental monitoring and characterization by Janick F Artiola, Ian L Pepper, Mark Brusseau
- 2) .Environmental Chemistry by Sawyer & McCarty.