

GUJARAT TECHNOLOGICAL UNIVERSITY
ENVIRONMENTAL ENGINEERING
B. E. SEMESTER: VII

Subject Name: **Environmental Monitoring and Data Management**
(Department Elective – I)

Subject Code: **171305**

| Teaching Scheme | | | | Evaluation Scheme | | | |
|-----------------|----------|-----------|-------|---------------------|-----------|---------------------------|----------------------|
| Theory | Tutorial | Practical | Total | University Exam (E) | | Mid Sem Exam (Theory) (M) | Practical (Internal) |
| | | | | Theory | Practical | | |
| 4 | 2 | 0 | 6 | 70 | 30 | 30 | 20 |

| Sr. No. | Course Contents | Total Hrs |
|---------|---|-----------|
| 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 | 10 |
| 2. | 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. | 12 |
| 3. | 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. | 12 |
| 4. | 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 | 10 |
| 5. | 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 | 10 |

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| 6. | 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 | 10 |
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List of Term work:

Term work will comprise of assignments on the questions related to

1. Environmental monitoring
2. Sampling locations :Air and water
3. Numericals on statistics in environmental monitoring,
4. Water quality monitoring,
5. Air quality monitoring,
6. Physical, chemical and microbial contaminants,
7. Surface water monitoring and
8. 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.