

COURSE: ENVIRONMENTAL MONITORING, SAMPLING & FIELD ANALYSIS**CREDIT HOURS: 3 - Taken Semester III****Actual HOURS: 2 hrs. Classroom & 2 hrs. Field Work****PREREQUISITES: Chem. I & II, Biology, Environmental Lab Analysis Technique**

COURSE DESCRIPTION: The objective of this course is to provide the student with a general understanding of environmental monitoring and sampling techniques in the medias of water, wastewater, groundwater, solid waste, sludge, soils, stack discharges and ambient air.

TOPICS**I. Water & Wastewater Monitoring, Sampling & Field Analysis**

- Flow Measuring
 - a. Electrical & mechanical devices
 - b. Weirs & Flumes
 - c. Surface Water
- Sampling objectives
 - a. Outfalls, surface, sewers
 - b. QA/QC Procedures
- Sampling Techniques
 - a. Types of Samples
 - 1. Automatic & Grab Samplers
 - 2. Microbiological
 - 3. Chemical
 - b. Sample Collecting, Preservation, Handling & Storage
 - c. Chain of Custodies
- Portable Field Analysis
 - a. Ph
 - b. Temperature
 - c. Physical/Chemical Field Analysis

II. Groundwater Sampling

- Groundwater Characteristics
- Monitoring Wells
- Sampling Techniques & Protocols
- Sampling Objectives & QA/QC Procedures

III. Soil, Solid Waste & Sludge Sampling

- Types & Frequency of Samples
- Sample Techniques
- Remedial Investigation
- Sampling Objectives & QA/QC Procedures

IV. Air Quality & Stack Monitoring, Sampling & Field Analysis

- Ambient Air Quality Monitoring
- Fundamental Meteorology
- Sampling Stations
- Stack Testing (USEPA Methods 1-10)
 - a. Air Flows in Stack
 - 1. Temperature
 - 2. Pressure
 - 3. Relative Humidity
 - 4. Pitot
 - b. Sample Train
 - c. Sampling Parameters
 - d. Preparation, Preservation & Chain of Custodies
 - e. Data collection
- Sampling Objectives & QA/QC Procedures

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V. Sampling Safety & Protection

- Personal Protective Equipment
- Confined Space Entry (Sewers)
- Stack Sampling Safety

VI. On-Line Computer Governmental References

COURSE REQUIREMENTS/GRADING STANDARDS

Students will be required to demonstrate their fulfillment of the objectives through:

1. Class Participation
2. Class Analysis
3. Test Performance

Students will be graded on the following scale:

Class Participation	20%
Tests	40%
Mid-term	15%
Final	<u>25%</u>
	100%

There will be no make-up examinations except in **RARE** emergencies. Any student whose performance is 87% or better prior to final examinations, will **NOT** be required to take the final examination.

INSTRUCTIONAL METHODS

The Lecturer Method of instruction will be used with emphasis on case analysis.