Subject: Environmental Pollution Analysis-MSCIN11503

Type of course: Major

Prerequisite: Students should have a basic knowledge regarding various types of pollution and their sources.

Rationale: The Prerequisite provides the foundation for understanding the concepts of pollution and how it should be managed.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P	C	Theory Marks		Practical Marks		CA	
				ESE	MSE	V	P	ALA	
4	0	0	4	60	30	10	00	50	150

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

Course Content:

Unit No.	Course content	Hrs	% Weightage
1	**Air pollution analysis**:- Introduction to air pollution, Structure of Atmosphere, Effect of air pollution on Man and Materials, Classification of air pollution, Analysis of SO2, H2S, HC,NO-NOx, CO-CO2,	15	25
2	**Water pollution analysis**:- Introduction to water pollution, Physical examination of water, Chemical characterization of water, Minor components of water, Biological investigation of water.	15	25
3	**Land pollution analysis**:- Introduction to land pollution, Chemistry of land, Land irrigation by effluents, Analysis of micronutrients in land, Trace element analysis in land.	15	25
4.	**Noise pollution & its measurement**:- Introduction to noise pollution, Source of noise, Types of noise, Noise measurement, Noise mapping.	15	25

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1.	**Activity:** Discuss local water bodies and identify potential sources of pollution through field visits or virtual tours. upload complete report on GMIU Web Portal.	10
2.	**Classification of Air Pollutants:** Use case studies to categorize pollutants into primary and secondary and discuss their sources and impacts.Upload complete report on GMIU Web portal.	10
3.	**Sources and Types of Noise:** Create a chart listing various noise sources (e.g., traffic, industrial) and classify them as point or non-point sources. Upload it on the GMIU Web portal.	10
4.	**Noise Source Categorization:** Provide students with a list or images of various noise sources (e.g., a	10

	jackhammer, a bird singing, a refrigerator humming, a car horn, a jet plane). Students work in groups to categorize these sources by their type (e.g., continuous, intermittent, impulsive) and then discuss the potential impact of each. and upload complete report on GMIU	
5.	**Micronutrient Role-Playing:** Write a brief note on the importance of micronutrients and what happens when they are deficient or in excess. Upload it on the GMIU Web portal.	10
Total		**50**

Suggested Specification table with Marks (Theory):60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	35%	35%	30%	00	00	00

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

After learning the course the students should be able to:	
CO1	Students will be able to define air pollution and describe atmospheric structure and composition.
CO2	Identify key concepts and sources of water pollution.
CO3	Define land pollution and describe how land chemistry responds to contaminants.
CO4	recommend remediation strategies and land management practices to restore soil quality.

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

Reference Books:

1. Environmental pollution analysis by S. M. Khopkar.
2. Chemical kinetics by S.K.Jain, Vishal publication.
3. Industrial analysis by B.K.Sharma, Gael publication.
4. Shreve's chemical process industries 5th Edition.