

COURSE CODE: ENS-325
COURSE NAME: Environmental Monitoring
CREDIT HOURS: Theory = 02 Practical = 01 Total = 03
CONTACT HOURS: Theory = 32 Practical = 48 Total = 80
PREREQUISITE: None
MODE OF TEACHING: Instruction: 2 hours of Lecture per week (67%)
 Lab Demonstration: 3 hours of Lab work per week (33%)

Course Description:

This course aims to provide information of techniques used in environmental monitoring and evaluation of different standards of environmental factors i.e., air, water, soil and living organisms.

TOPICS COVERED:

Week#	Topics
1	Introduction, objectives of sampling and monitoring program
2	Design and types of samples
3	Pre-sampling requirements/information, sampling and design purposes
4	Application of national and international methods of sampling
5	Regulatory purposes for NEQS compliance
6	EIA requirement, NOC for plant operation
7	Determination of concentration and distribution of a specific pollutant
8	Environment sampling techniques. Quality assurance and quality control
9	Midterm Exam – MSE
10	Planning analytic protocols, quality assurance program, quality control sampling
11	Sampling considerations, quality assessment
12	Field custody, laboratory custody
13	Preservation methods including pH control, chemical addition, refrigeration and freezing methods

14	Biological indicators for environmental monitoring
15	Biological indicators for environmental monitoring
16	Role of biomarkers in environmental assessment
17	Role of biomarkers in environmental assessment
18	End Semester Exam

Practical Work:

Week#	Topics
1	Orientation
2	Sampling techniques (air) for physical and chemical monitoring
3	Sampling techniques (water) for physical and chemical monitoring
4	Sampling techniques (soil) for physical and chemical monitoring
5	Study the indicators for biological monitoring of the river and canal water
6	Study the indicators for biological monitoring of the river and canal water
7	The indicators for ecological monitoring in the field for fauna and flora
8	The indicators for ecological monitoring in the field for fauna and flora
9	Midterm Exam – MSE
10	Use of various instrumental techniques for analysis of samples
11	Use of various instrumental techniques for analysis of samples
12	Use of various instrumental techniques for analysis of samples
13	Use of various instrumental techniques for analysis of samples
14	Field visit/ study tour to water testing laboratory/local water authority and report writing
15	Visit to EPAs for the study of air and water monitoring procedures
16	Report on monitoring of municipal waste
17	Presentations
18	End Semester Exam

Text and Material:

1. Environmental Monitoring by Clara Simon, Murphy & Moore Publishing, 2022.
2. Environmental Monitoring Handbook, Burden, F. R, McKlivie, I. D., Forstner U. and Guethner. (eds.) McGraw-Hill, USA.
3. Environmental Chemistry by Manahan, S. E., 11th edition, 2022.

ASSESSMENT SYSTEM:

Theoretical/Instruction	100%
Assignments	10%
Quizzes	15%
Mid Semester Exam	25%
End Semester Exam	50%
Practical Work	100%
Lab Work	70%
Lab Exam/Projects	30%