ENS-224 SOIL AND ENVIRONMENT 3(2+1)

COURSE CODE:	ENS-224		
COURSE NAME:	Soil and Environment		
CREDIT HOURS:	Theory = 2	Practical = 01	Total = 03
CONTACT HOURS:	Theory = 32	Practical = 48	Total = 80
PREREQUISITE:	None		
MODE OF TEACHING:	2 hours of Lecture and 3 hours of Lab per week (67% + 33%)		

COURSE DESCRIPTION:

This course will provide students with the knowledge of the basic properties and significance of soil and its care for a sustainable environment.

COURSE LEARNING OUTCOMES:

By the end of this course, students will be able to:

a) Explain the composition, formation processes, properties, and classification of soils, including their environmental significance and role in sustainable land management.
b) Analyze the environmental impacts of fertilizers, agrochemicals, and various waste streams on soil quality and propose appropriate soil management practices.
c) Perform standard laboratory procedures to assess physical and chemical soil parameters, interpret results, and relate findings to soil health and environmental quality.

TOPICS COVERED:

Theory:

Week	Topic
1	Soil composition and chemistry
2	Types and properties of parent materials
3	Physical processes of weathering
4	Chemical processes of weathering
5	Factors and processes of soil formation
6	Physical properties of soil
7	Chemical properties of soil
8	Soil morphology and classification Cation and anion exchange
9	**Mid Semester Exam**
10	Soil buffering capacity and its importance
11	Soil degradation
12	Soil management and green productivity
13	Environmental implications of fertilizers
14	Environmental implications of other agrochemicals
15	Environmental impact of agricultural wastes on soil
16	Environmental impact of Industrial wastes on soil
17	Soil as a natural sink for pollutants
18	**End Semester Exam**

Practical:

No.	Practical/ Topics

1	Soil sampling, sample handling and storage
2	Preparation of saturated soil paste and measurement of pH
3	Measurement of electrical conductivity (EC) in soil
4	Determination of soil water contents
5	Bulk density measurement in a soil sample
6	Determination of soil porosity
7	Soil texture: feel and hydrometer methods
8	Identification and calculation of nutrient percentage from fertilizer
9	Determination of soil organic matter
10	Soil nitrogen measurement by Kjeldahl method
11	Determination of soil phosphorous by Olsen's method
12	Soil alkalinity and sodicity measurement

TEXT AND MATERIAL:

1. The Nature and Properties of Soils, Brady, N.C. and Weil, R.R. Prentice- Hall, Latest Edition. Upper Saddle River, NJ, USA.
2. Environmental Soil Science. Latest Edition by Kim H. Tan.
3. Biological Approaches to Regenerative Soil Systems. Latest Edition By Norman Uphoff, Janice Thies.

ASSESSMENT SYSTEM:

Theoretical/ Instruction		
Assessment Category	**Marks Distribution (%)**	
	Without Project	**With Project**
Quiz	15	10-15
Assignment	10	5-10
MSE	25	25
Project	-	5-10
ESE	50	45-50
Lab		
Assessment Category	**Marks Distribution (%)**	
Lab Work/ Psychomotor Assessment/ Lab Reports	50–70	
Lab Project/ Open-ended Lab Project/ Assignment/Quiz	10–20	
Final Assessment/ Mid Semester Assessment (Written, viva, hands-on experimentation, group task)	20–30	