Certificate course	December (Even Semester)	Soil Analysis
PO's Aligned – As listed below		Credit- 02 (T-1, P-1), Total Number of Teaching Hours- 45Hrs

PROGRAMME OUTCOMES (POs)

PO-1: Experimental & Analytical Proficiency: The curriculum emphasizes mastery in designing and conducting scientific experiments using standard methodologies. Students critically evaluate and interpret data to derive reliable, reproducible scientific conclusions.

PO-2: Environmental Consciousness & Sustainability: The program cultivates the ability to apply analytical knowledge to global sustainability challenges. Students are encouraged to propose evidence-based solutions that align with soil analysis and sustainable development goals

Programme Specific Outcomes (PSOs)

PSO1: Mastery in Microbial Techniques and Innovations: Candidates will acquire proficiency in classical and modern analytical techniques for advancing research.

PSO2: Application of soil analysis to Health, Agriculture, and Industry: Candidates will apply analytical knowledge to develop practical solutions in soil analysis.

Course Outcomes (COs)

CO1: Explain the significance of soil analysis and demonstrate understanding of key preparatory concepts of soil testing

CO2: Perform standard soil analysis procedures to determine its various physico-chemical parameters for agronomic and environmental applications.

Mapping matrix of POs , PSOs and COs

	POs			PSOs		
CO \ PO	1	2	CO Avg	1	2	CO Avg
CO1	2	3	2.5	1	2	1.5
CO2	3	3	3.0	2	3	2.5
PO /CO Avg	2	3	2.5	1	2	1.5

(1-weak correlation; 2-medium correlation; 3-strong correlation)

This course will provide theoretical as well as practical knowledge about Soil Analysis

Teaching Pedagogy

1. Lecture method
2. Seminar method
3. Demonstrations method

Teaching Methods and Tools

1.Direct Teaching using Black board,
2. Presentations,
3. Multimedia resources,
4. Diagrams and Layouts,
5. Group discussion and activity,
6. Experimentation,
7. Hands on training

Detailed Syllabus		
Unit-1 Theory (Credit: 01, Teaching Hours: 15)		
Title		**Number of Teaching Hours**
1	Importance of Soil Analysis.	3
2	Introduction to analytical chemistry- What is normality and molarity solution	3
3	Introduction to soil sampling- Importance of soil sampling, sampling units, sampling depth, quartering method of mixing.	3
4	Collection and preparation of soil samples for analysis	3
5	Preparation of soil sample for analysis- sieving and storing, objectives of soil testing	3
	Unit-2 Practical (Credit: 01, Teaching Hours: 30)	
	Determination of pH and EC (Electrical conductivity) in soil sample- Reagents preparation, weighing and analysis of soil sample, calculation of results, interpretation	3
6	Determination of moisture content in soil sample- Reagents preparation, weighing and analysis of soil sample, calculation of results, interpretation	6
7	Determination of organic carbon content in soil sample- Reagents preparation, weighing and analysis of soil sample, calculation of results, interpretation	4
8	Determination of available nitrogen content in soil sample- Reagents preparation, weighing and analysis of soil sample, calculation of results, interpretation	6
9	Determination of available phosphorus content in soil sample- Reagents preparation, weighing and analysis of soil sample, calculation of results, interpretation	6
10	Determination of exchangeable potassium content in soil sample- Reagents preparation, weighing and analysis of soil sample, calculation of results, interpretation	5

Assessment Method	
Internal/Online Assessment (40%)	1. Written test (20 Marks) 2 .Quiz / Group Discussion (10 Marks) 3. Assignments / Seminar (10 Marks)
External Assessment (60%)	Term End Theory examination (Written test 60 Marks)

References-

A Text Book of Soil Analysis. by Baruah, T.C. and Barthakur, H.P. (1997) UBS Publishers Ltd., New Delhi.

Methods of Soil Analysis- Part-1 to 3, Published by American Society of Agronomy- Soil Science Society of America

Manual on Soil, Plant and Water Analysis, by Dhyan Singh, P. K. Chhonkar and B. S. Dwivedi, Westville Publishing House, New Delhi