

Course Code	Course Name	Credits
26CH103	AGRICULTURAL CHEMISTRY	04

Course Objectives

- To provide a comprehensive understanding of soil chemistry, plant nutrition, and fertilizer science, with emphasis on soil fertility, nutrient management, and crop productivity.
- To develop knowledge of the classification, preparation, and application of fertilizers, pesticides, insecticides, fungicides, and herbicides in agricultural chemistry.
- To enable students to analyze the environmental impact and safe use of agrochemicals for sustainable agricultural practices and soil health management.

Learning Outcomes

Upon successful completion of this course it is intended that a student will be able to:

- Gain knowledge on concepts and principles of Soil Science
- Comprehensive knowledge on rocks and minerals, their composition and the types of soils formed from different parent materials.
- Understand the role of soil forming factors and processes in soil formation, reclamation and management of soil physical and chemical constraints
- Imparts knowledge on essential nutrients, soil fertility, nutrient transformations in soil. Manures, fertilizers and soil fertility management through various approaches.
- Proper understanding of chemistry of pesticides will be inculcated among the students.
- Ability to choose the appropriate reagents in organic synthesis.

Unit 1 - Soil (13 Hrs.)

Origin of soils; properties of soils; acidic, alkaline, and saline soils; diagnosis and remediation of acid- and salt-affected soils; methods of reclamation and aftercare; chemical aspects of soil; soil testing including concept, objectives, and basis; soil sampling; tools; collection, processing, and dispatch of soil samples; soil organic matter; decomposition of soil organic matter; effect on soil fertility.

Unit 2 – Plant nutrient (12 Hrs.)

Macro- and micronutrients; role in plant growth; sources; forms of nutrients absorbed by plants; factors affecting nutrient absorption; deficiency symptoms in plants; corrective measures; chemicals used for correcting nutritional deficiencies; nutrient requirements of crops; availability, fixation, and release of nutrients.

Unit 3 - Fertilizers (13 Hrs.)

Classification of NPK fertilizers; natural and synthetic sources; straight, complex, and liquid fertilizers; properties; use and relative efficiency; secondary and micronutrient fertilizers; mixed fertilizers; commercial methods of preparation of urea and triple superphosphate.

Unit 4 – Pesticides and Insecticides (12 Hrs.)

Pesticides: definition; classification into organic and inorganic pesticides; mechanism of action; characteristics; safe handling of pesticides; impact of pesticides on soil, plants, and environment; insecticides: plant products; nicotine; pyrethrin; inorganic pesticides; borates; organic pesticides including DDT and BHC.

Unit 5 – Fungicide and Herbicides (10 Hrs.)

Fungicides: definition; classification; mechanism of action; sulphur compounds; copper compounds; mercury compounds; dithanes; dithiocarbamates; herbicides; acaricides; rodenticides; attractants; repellents; preservation of seeds.

Reference Books:

- T.D Biswas and S.K Mukherjee Text book of soil science 1987.
- A.J Daji , A text book of soil science, 1970 Asia publishing House, Madras.
- S.L Tisdale ,W.L. Nelson and J.D Beaton Soil fertility and fertilizers,1990 Macmillon Pub Co New York .
- P.R Hesse, John Murray, A text book of soil chemical analysis, 1971 NewYork.
- K.H Buchel , Chemistry of Pesticides, 1983 John Wiley & Sons New York.
- V.S SreeRamulu V.S, Chemistry of Insecticides and Fungicides, 1979 Oxford and IBH Publishing Co., New Delhi.

Websites and eLearning Sources:

- <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=13G8VouhmrFfuhs6rkiyTA==>
- <https://link.springer.com/article/10.1007/s11104-021-05171-w>
- <https://www.youtube.com/watch?v=MAIfQJIFIS0>

COs and Bloom's Taxonomy Mapping – 26CH103		
Course Outcomes	On completing U.G. program the students will be able to	BTL
CO1	Understand and remember the basic concept of origin and chemical composition of soil.	K1, K2
CO2	applying the needs of macro and micro nutrients and their needs as well as deficiency towards plants.	K3
CO3	Classifies different fertilizer and their synthetic pathway for the effective utilization according to their requirement.	K4
CO4	Evaluate the effect of pesticides toward variety of insects and their impact toward environment.	K5
CO5	Formulate the excessive utilization of variety of pesticides, undecides, herbicides and so on from contaminating human will being.	K6

BTL K1 and K2 – remembering and understanding, K3- Applying, K4 – Analyse, K5- Evaluate and K6- Create

Relationship Matrix – 26CH103													
Course Outcomes	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)						Mean Score of Cos
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	3	2	2	1	1	1	3	2	2	1	1	2	1.8
CO2	2	2	2	2	2	1	3	3	2	2	2	3	2.1
CO3	2	3	2	2	2	2	3	3	2	1	2	3	2.1
CO4	3	3	3	2	2	1	3	3	2	2	1	1	2
CO5	3	3	3	3	2	1	3	3	3	3	1	3	2.5
Total													2.1

Mean Score: 3- High, 2- Medium/Moderate, 1-Low

