



KHALSA COLLEGE, AMRITSAR

Post Graduate Department of Chemistry

FACULTY OF SCIENCES

SYLLABUS

FOR

B.Sc. (Hons.) Agriculture

(Semester IV)

Session: 2024-25



KHALSA COLLEGE

AMRITSAR

(An Autonomous College)

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KHALSA COLLEGE, AMRITSAR

Post Graduate Department of Chemistry

B.Sc. (Hons.) Agriculture Semester – IV

ACH-2210 Agrochemicals

Time: 3 Hours

Credit Hrs. : 3 (2+1)

Max. Marks: 100

Theory: 50

Practical: 25

Internal assessment: 25

INSTRUCTIONS FOR THE PAPER SETTERS:

1. Question paper should be set strictly according to the syllabus.
2. The language of questions should be straight & simple.
3. There will be total of nine questions, out of which first question (comprising of 10 short answer type questions) covering the whole syllabus will be compulsory.
4. Of the remaining 8 questions, two questions will be asked from each section (A,B,C,D) and the candidate will attempt 4 questions (one from each section). All questions will carry equal marks (10).

COURSE OBJECTIVES:

The course is entirely designed to teach the students of Agriculture regarding the careful use of chemical like insecticides, pesticides, herbicides, fertilizers and quantitative and qualitative analysis of fertilizers, soil, water and other related chemicals.

COURSE CONTENTS:

Theory:

Section – A

An introduction to agrochemicals, their type and role in agriculture, effect on environment, soil, human and animal health, merits and demerits of their uses in agriculture, management of agrochemicals for sustainable agriculture. Herbicides-Major classes, properties and important herbicides. Fate of herbicides. Fungicides - Classification – Inorganic fungicides - characteristics, preparation and use of sulfur and copper, Mode of action-Bordeaux mixture and copper oxychloride. Organic fungicides- Mode of action-Dithiocarbamates-characteristics, preparation and use of Zineb and maneb. Systemic fungicides-Benomyl, carboxin, oxycarboxin, Metalaxyl, Carbendazim, characteristics and use.

Section - B

Introduction and classification of insecticides: inorganic and organic insecticides Organochlorine, Organophosphates, Carbamates, Synthetic pyrethroids Neonicotinoids, Biorationals, Insecticide Act and rules, Insecticides banned, withdrawn and restricted use, Fate of insecticides in soil & plant. IGRs Biopesticides, Reduced risk insecticides, Botanicals, plant and animal systemic insecticides their characteristics and uses.

Section – C

Fertilizers and their importance. Nitrogenous fertilizers: Feed stocks and Manufacturing of ammonium sulphate, ammonium nitrate, ammonium chloride, urea. Slow release N-fertilizers. Phosphatic fertilizers: feedstock and manufacturing of single superphosphate. Preparation of bone meal and basic slag. Potassic



fertilizers: Natural sources of potash, manufacturing of potassium chloride, potassium sulphate and potassium nitrate.

Section – D

Mixed and complex fertilizers: Sources and compatibility–preparation of major, secondary and micronutrient mixtures. Complex fertilizers: Manufacturing of ammonium phosphates, nitrophosphates and NPK complexes. Fertilizer control order. Fertilizer logistics and marketing. Plant bio-pesticides for ecological agriculture, Bio-insect repellent.

Practical

Sampling of fertilizers and pesticides. Pesticides application technology to study about various pesticides appliances. Quick tests for identification of common fertilizers. Identification of anion and cation in fertilizer. Calculation of doses of insecticides to be used. To study and identify various formulations of insecticide available in market. Estimation of nitrogen in Urea. Estimation of water soluble P₂O₅ and citrate soluble P₂O₅ in single super phosphate. Estimation of potassium in Muraite of Potash/ Sulphate of Potash by flame photometer. Determination of copper content in copper oxychloride. Determination of sulphur content in sulphur fungicide. Determination of thiram. Determination of ziram content.

COURSE OUTCOMES:

S. No.	On completing the course,
CO1	Students will be able to know the various types of herbicides, fungicides available for plants, their toxicity and safer use.
CO2	Students will be having the knowledge of various insecticides, their characteristics and safer use.
CO3	It will also enhance the knowledge regarding the fertilizers and their optimum use for better productivity
CO4	It will also enhance the knowledge of mixed fertilizers and their compatibility.
CO5	Understand the quantitative and qualitative methods of analysis of fertilizers, soil, water and other related chemicals.