1. Mann, F. G., & Saunders, B. C. (2009). Practical organic chemistry. Pearson Education.

2. Dean, J. R., Jones A.M, Holmes, D., & Reed, R. (2011). Practical Skills in chemistry. Prentice-Hall.

3. Wilson, K., & Walker, J. M. (2000). Principles and techniques of practical biochemistry. Cambridge University Press.

4. Gowenlock. A.H. (1988). Varley's Practical Clinical Biochemistry. CRC Press.

5. Pasricha, S., & Chaudhary, A. (2021). Practical Organic Chemistry: Volume II. IK International Publishing House Pvt. Ltd.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

GENERIC ELECTIVE (GE-01)

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical/ Practice		
Agricultural Pests of Crops **ALS ZOO GE 01**	**4**	**2**	**0**	**2**	NIL	**NIL**

Objectives:

The study of agricultural pests focusses on identification of different types of pests, their life cycle and the harm they cause to the crops and stored grains. This course will help the students to understand the concept of insect pests and their population dynamics in relation to changing environmental conditions. The students will be taught the appropriate control measures to manage the pest population in nature so as to avoid heavy economic losses.

Learning Outcomes:

On completion of the course, students will be able to:

- Learn about the variety of important pests of crops, fruits, vegetables and stored grain.

- Understand the difference between various types of pests and extent of damage caused by them.
- Learn varied types of control measures for management of pest populations and list suitable control measures specific for each pest.

Theory:

Unit 1: Hours: 05

Introduction and Classification of pests, Factors responsible for emergence of pest, Pest status, Pest population dynamics.

Unit 2: Hours: 12

Bionomics and control of crop pests: Rice pest (*Leptocorisaacuta,*), Wheat pest (*Sesamiainferens*), Pulse pest (*Helicoverpaarmigera*), Sugarcane pests (*Scirpophaganivella, Pyrillaperpusilla*), Cotton pests (*Eariasvitella, Pectinophoragossypiella*), Vegetable pest (*Raphidopalpafaveicollis, Leucinodesorbonalis),* Fruit pest *(Papiliodemoleus)***.**

Unit 3: Hours: 08

Polyphagous pests: Stored grain pests: *Sitophilus oryzae, Corcyra cephalonica, Trogoderma granarium, Callosobruchuschinensis.* Bionomics and strategies for the management of stored grain pests

Unit 4: Hours: 05

Bionomics and management of Grass hopper (*Schistocerca Americana*), White grubs, Bihar hairy caterpillar and Termites.

Practical:

1. Identification of crop pests-

(a) Rice pest: *Leptocorisaacuta,*

(b) Wheat pest: *Sesamiainferens,*

(c) Pulse pest: *Helicoverpaarmigera,*

(d) Sugarcane pests: *Scirpophaganivella, Pyrillaperpusilla,*

(e) Cotton pests: *Eariasvitella, Pectinophoragossypiella, Dysdercuskoenigii,*

(f) Vegetable pest: *Raphidopalpafaveicollis, Leucinodesorbonalis,*

(g) Fruit pest: *Papiliodemoleus.*

2. Identification of stored grain insect pests: *Sitophilus oryzae, Corcyra cephalonica, Trogoderma granarium, Callosobruchuschinensis.*
3. Culture of two crop insects of economic importance and submission of culture report.
4. Study of the life history of two different insect pests (Submission of life cycle stages from culture).
5. Visit to IARI (Pusa), and other ICAR Institutes.

Essential/recommended readings

1. Pedigo, L.P. (1996) *Entomology and Pest Management*. Prentice Hall.
2. S. Pradhan. *Insect Pest of Crops* (2011). National Book Trust.
3. Atwal, A.S. (1993) *Agricultural Pests of India and South East Asia*. Kalyani Publishers.

Suggestive readings

1. Dennis, S. Hill (2005) *Agricultural Insect Pests of the Tropics and Their Management*. Cambridge University press.
2. Tembhare, D. B. (2017). Modern Entomology. Himalaya Publishing House Pvt. Ltd. Mumbai.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

GENERIC ELECTIVE (GE-02)

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical/ Practice		
Insect Vectors and Diseases	**4**	**2**	**0**	**2**	NIL	**NIL**

Objectives:

Insect vectors spread a variety of diseases, resulting in millions of fatalities each year around the world, particularly in developing countries. The transmission by Insect-borne pathogen is increasing at an alarming rate, posing an increasing menace to human health. The transmission of