DISCIPLINE SPECIFIC ELECTIVE COURSE: **ALS ZOO DSE 08**

NON-INSECT PESTS AND THEIR CONTROL

Credits distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practicals / Practice		
Non-insect pests and their control ALS ZOO DSE 08	4	2	Nil	2	Appeared in Sem-VI	NA

Learning Objectives:

The learning objectives of this course are as follows:

- to introduce students with various types of non-insect pests in agriculture and household.
- to give an understanding of their behaviour and the damage they cause to crops
- to acquaint with various plant economic losses caused by non-insect pests.

Learning Outcomes:

By studying this course, the students will be able to:

- recognize major non-insect pests in Indian subcontinent.
- identify the specific life stage of the pest which causes significant loss to crop plants and adopt appropriate measures to control them.

Theory **30h**

Unit 1: Introduction to non-insect pests and their management **8 h**

Introduction, habit and habitat and economic importance of non-insect pests and their management. Major mite pests of cultivated and plantation crops, Economic importance along with their management strategies. Study of Red spider mite (*Tetranychus neocaledonicus*) and Cereal rust mite (*Abacarus hystrix*), its damage on different crops and control measures.

Unit 2: Damage to crops by Molluscs and and their control **7 h**

Important species of snails and slugs as pest in India. Description of their nature of damage on agricultural crops, fruits, vegetables and ornamental plants in coastal area. Study of *Helix* sp and Indian slug species (*Macrochlymus indica*)**.** Strategies for their management.

Unit 3: Nematodes as pests of crops and their control **7 h**

Habitat, general characteristics and management of major phyto-nematodes. Study of Root-knot nematode (*Meloidogyne incognita*) and cyst nematode (*Heterodera rostochiensis)*, its impact on crops and control measures.

Unit 4: Damage to crops by the pests and their management **8 h**

Study of important bird pests of agricultural crops and their control: Rose ringed parakeet (*Psittacula krameri*) and blue rock pigeon (*Columba livia*); damage caused by them and their management. Status of rodents as pest in India. Important species of rodents. Study of Indian mole-rat (*Bandicota bengalensis*), palm ***squirrel*** (*Funambulus palmarum*) and Indian fruit bat (*Pteropus giganteus*) with its nature of damage and control measure.

Practicals **60 h**

(Laboratory periods: 15 classes of 4 hours each)

1. Identification, life cycle and damage caused by following mites *with specimen/Photograph:*
Red spider mite (*Tetranychus neocaledonicus*), Cereal rust mite (*Abacarus hystrix),* Broad mite (*Polyphagotarsonemus latus*)

2. Identification and damage caused by of the following molluscan *with specimen/Photograph:*
Common snail, *Helix* spp and Indian slug (*Macrochlymus indica*)

3. Identification and damage caused by of the following nematode *with specimen/Photograph:*
Root-knot nematode (*Meloidogyne incognita*), cyst nematode (*Heterodera rostochiensis)* and Wheat-gall nematode (*Anguina tritici*)

4. Identification and damage caused by of the following Birds *with specimen/Photograph:*
Rose ringed parakeet (*Psittacula krameria*) and blue rock pigeon (*Columba livia*)

5.Identification and damage caused by of the following mammals *with specimen/Photograph:*
Indian mole-rat (*Bandicota bengalensis*), Commonrat (*Rattus rattus*), palm ***squirrel*** (*Funambulus palmarum*), Indian fruit bat (*Pteropus giganteus*) and common monkey (*Macaca mulatta*)

6. To visit any agriculture Institute and make a project report on main agriculture crops pest and its management.

Essential/recommended readings

1. Dhaliwal, G.S. (2009). *An Outline of Entomology* (2nd Ed.). Kalyani Publishers.
2. Atwal A.S. &Dhaliwal G.S. (2015) *Agricultural pests of south Asia and their management* (8th ed.). Kalyani Publishers.

Suggested readings

1. Devasahayam H.L (2011) *Practicals Manual of Entomology: Insects and Non-insect Pests*. New India Publishing Agency.

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