Bachelor of Science (Hons.) in Applied Life Sciences with Agrochemicals and Pest Management

SEMESTER-IV

ZOOLOGY COMPONENT – DSC

DISCIPLINE SPECIFIC CORE COURSE (DSC 04)

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 ALS ZOO DSC 04	4	2	0	2	Class 12th Pass with Science	NIL

Learning Objectives:

The learning objectives of this course are as follows:

- to impart knowledge about the various agricultural pests and the nature of damage caused by them.
- to apprise the students of the lifecycle of the pest and the specific stage at which it is destructive to the host.
- to acquaint them of the different control measures applied for the management of pests.

Learning Outcomes:

By studying this course, students will be able to:

- identify and differentiate among various types of pests.
- acquire knowledge of the damage caused by agricultural pests.
- better understand the methods of control for the management of the pests.

Unit 1: Introduction **(3 Hours)**

Classification, identification, distribution and host-range of agricultural pests; Overview of: bionomics, nature and extent of damage, seasonal abundance and management of insect pests.

Unit 2: Pests of Cereals **(2 Hours)**

Biology, nature, extent of damage and control: *Chilozonellus*, *Sesamia inferens*

Unit 3: Pests of Oilseeds **(4 Hours)**

Bionomics, lifecycle and management: *Lipaphis erysimi*, *Athalialugen sproxima*, *Achaea janata*, *Euproctis lunata.*

Unit 4: Pests of Fibre Crops **(5 Hours)**

Bionomics, life cycle and management*: Helicoverpa armigera, Earias vitella*, *Pectinophora gossypiella*, *Oxycarenus laetus*, *Dysdercus koenigii.*

Unit 5: Pests of Paddy and Sugarcane **(5 Hours)**

Biology, nature of damage and control: *Leptocorisa varicornis*, *Hispa (Dicladispa) armigera*, *Spodoptera exempta, Scirpophaga nivella*, *Pyrilla perpusilla*, *Emmalocera depressella, Aleurolobus barodensis.*

Unit 6: Stored Grain Pests **(6 Hours)**

Life cycle, nature of damage and control: *Sitophilus oryzae*, *Rhyzopertha dominica*, *Trogoderma granarium, Sitotroga cerealella*, *Callosobruchus chinensis, Atherigona varia*, *Calocorisan gustatus, Mythimna separate*, *Macrosiphum miscanthi /Sitobion avenae*.

Unit 7: **Polyphagus Pests** **(5 Hours)**

Lifecycle and control: grasshopper, locust, termite, white grub, hairy caterpillar, and non-insect pests (mites, birds, rodents, snails, slugs).

PRACTICAL **(60 Hours)**

1. Identification, life cycle and damage caused by following pests:

Chilozonellus, Sesamia inferens, Lipaphis erysimi, Helicoverpa armigera, Earias vitella, *Pectinophora gossypiella*, *Oxycarenus laetus*, *Dysdercus koenigii. Athalialugen sproxima, Achaea janata, Euproctis lunata, Hispa(Dicladispa) armigera, Spodoptera exempta, Pyrilla perpusilla*, *Emmalocera depresse, Sitophilus oryzae*, *Rhyzopertha dominica*, *Trogoderma granarium, Sitotroga cerealella*, *Callosobruchus chinensis, Atherigona varia*, *Calocorisan gustatus, Mythimna separate*, *Macrosiphum miscanthi /Sitobion avenae*.

2. Identification and life cycle of grasshoppers and locusts.
3. Study of life cycle and management of non-insect pests through specimens/photographs.
4. Collection and identification of stored grains pests and nature of damage caused by them.
5. Field visits to Central warehouse/FCI godowns/ CFTRI, IGSMRI.

Essential/recommended readings

1. Dhaliwal G.S. and Singh R. (2004) *Host Plant Resistance to Insects - Concepts and Applications*. Panima Publications., New Delhi.
2. Evans J.W. (2005). *Insect Pests and their Control.* Asiatic Publications., New Delhi.
3. Atwal A.S. and Dhaliwal G.S. (2018) *Agricultural Pests of South Asia and their Management,* 7th Edition Kalyani Publ., New Delhi.

Suggestive readings

1. Maxwell F.G. and Jennings P.R. (Eds). (1980) *Breeding Plants Resistant to Insects.* John Wiley and Sons, New York.
2. Sharma V. (2015) *Agricultural Pest Management*, Rajat Publications.

3. Awasthi V. B. (2017) Agricultural Insect Pest and their Control, 2nd edition, Scientific Publisher India.

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

ZOOLOGY COMPONENT – DSE

DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE 02)

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
		Lecture	Tutorial	Practical/ Practice		
Developmental Biology of Animals ALS ZOO DSE 02	**4**	**2**	**0**	**2**	**Class 12th Pass with Science**	NIL

Learning Objectives:

The learning objectives of this course are as follows:

- to acquaint students of different phases of development and changes from embryonic to post-embryonic stage.
- to comprehend the basic principles and concepts underlying developmental processes at the cellular and molecular level.
- to learn about gametogenesis, cleavage patterns, morphogenetic movements and the importance of extraembryonic membranes.