

**SYLLABUS FOR UNDERGRADUATE PROGRAMME IN APPLIED LIFE
SCIENCES WITH AGROCHEMICALS AND PEST MANAGEMENT**

(ZOOLOGY-COMPONENT)

DISCIPLINE SPECIFIC CORE COURSE – 2:

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 (if any)
		Lecture	Tutorial	Practical/ Practice		
Entomology ALS ZOO DSC 02	4	2	0	2	Class XII pass with Biology and Chemistry	NA

Learning Objectives:

Learning objectives of this course are as follows:

- The course will give knowledge of the diversity of insects.
- It will impart knowledge about the morphology, anatomy and physiology of the insects.
- It will correlate the structural organization in different groups of insects with respect to the niche they occupy.

Learning Outcomes:

By studying this course, students will be able to:

- identify and classify insects up to orders.
- learn the methods of collection, preservation and rearing of insects.
- learn about the anatomy and physiology of various organ systems in insects.
- understand the concept of insect metamorphosis.

Unit 1: Taxonomy (7 Hours)

Salient features of insects, Basis of insect classification; Outline of insect classification upto orders, Characteristics of economically important orders.

Unit 2: Morphology of insects (12 Hours)

Segmentation in insects; Head: typical structure of head, types of head, Antenna: typical structure, modification in antennae, types of mouth parts (Biting and chewing, sponging, piercing and sucking, siphoning and lapping), Compound eyes: structure of ommatidium, superposition and appositional images, Thoracic structures: Legs: typical structure of legs, modification in legs, modification in wings, veinations, coupling mechanisms.

Unit 3: Physiology of insects (7 Hours)

Physiology of digestion, excretion, respiration, circulation, sense organs (mechano and chemoreceptors).

Unit 4: Reproduction and Development (4 Hours)

Embryonic and post-embryonic development; Types of metamorphosis, Parthenogenesis

PRACTICAL(60 hours)

1. Collection, dry mounting, labelling and preservation of insects.
2. Study of mouth parts: biting and chewing, sponging, piercing and sucking, siphoning and lapping type through slides/ photographs.
3. Study of different types of wings, legs and antennae through slides/ photograph of insects.
4. Study of one insect from each economically important order (Thysanura, Odonata, Orthoptera, Dermaptera, Isoptera, Hemiptera, Thysanoptera, Lepidoptera, Diptera, Siphonaptera, Hymenoptera, Coleoptera and Strepsiptera) through specimens/ photographs.
5. Visit to Entomology Division IARI, Pusa, New Delhi.
6. Submission of project report on the basis of Field/Lab visit.

Essential/recommended readings

1. Imms, A. D. (1977) A General Text Book of Entomology. Chapman & Hall, UK.
2. Chapman, R. F. (1998) The insects: Structure and Function. Cambridge University Press, UK.

3. Atwal, A.S. (1993) Agricultural Pests of India and South East Asia. Kalyani Publishers, NewDelhi.
4. Dennis, S. Hill. (2005) Agricultural Insect Pests of the Tropics and Their Management, Cambridge University Press

Suggestive readings

1. David, B.V. and Ananthakrishnan, T.N. (2004) General and Applied Entomology. Tata-McGraw Hill, New Delhi.
2. Duntson, P.A. (2004) The insects: Structure, Function and Biodiversity. Kalyani Publishers, New Delhi.
3. Wigglesworth, V.B. (1984) Insect Physiology. VIII Edition, Chapman & Hall, NewYork.

E contents:

<https://swayam.gov/appliedentomology>.

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

GENERIC ELECTIVE – 4:

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 (if any)
		Lecture	Tutorial	Practical/ Practice		
Animal Cell Culture techniques ALS ZOO GE 04	4	2	0	2	Class XII pass with Biology and Chemistry	NA

Learning Objectives:

The learning objectives of this course are as follows: