DISCIPLINE SPECIFIC ELECTIVE COURSE: **ALS ZOO DSE 13**

Insect Toxicology

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		
Toxicology of Pests **ALS ZOO DSE 13**	**4**	**2**	**nil**	**2**	**Appeared in Sem-VII**	NA

Learning Objectives:

Learning objectives of this course are as follows:

- To impart knowledge about the biological effects of toxic chemicals on insects.
- To emphasize on factors affecting toxicity of insecticides and synergistic substances which can be used to increase their efficacy.
- To enable students to understand the development of resistance in insects to insecticides.

Learning Outcomes:

By studying this course, students will be able to:

- learn about the principles of insecticide toxicity
- understand the safe use of toxic insecticides as well as treatments for insecticide poisoning.
- acquire Practicals skills of pest management in public buildings like termite proofing, rodent control.

Theory **30h**

Unit 1. Introduction to Toxicology **4h**

History of chemical control, Pesticides registration, Pesticide industries and markets.

Unit 2. Principles of Toxicology **10h**

Evaluation of insecticide toxicity: LC50/ LD50, ED50, LT50 etc, Tolerance limits, ADI value, Bioaccumulation; Joint action of insecticides: synergism, potentiation, antagonism, Insecticide compatibility, selectivity and Phytotoxicity, Factors affecting toxicity of insecticides.

Unit 3. Pesticide metabolism **8 h**

Mode of entry of pesticides: I, F, W Insecticides and their metabolism - phase I and phase II pathways, Pest resistance to insecticides; Mechanisms and types of resistance; Diagnosis and treatment of insecticide poisoning, Health hazards: carcinogenic, mutagenic and teratogenic effects.

Unit 4. Pest Management in Residential and Public Places **8 h**

Principles and methods of pest management in residential places and public buildings, Insecticides for domestic use and their safety, Pre and post-construction termite proofing of buildings, Appliances for domestic pest control; Organic methods of domestic pest management.

Practicals **60 h**

(Laboratory periods: 15 classes of 4 hours each)

1. To calculate LD50/ED50/LT50 of an insecticide from data provided.
2. To study the equipment used for spraying and dusting of insecticide**s.**
3. Metabolism of insecticides in insects using TLC
4. Pesticide residues analysis of soil samples by soxhlet extraction method
5. Video Demonstration of Gas chromatography/ HPLC.
6 Project Report on visit to IARI, IPFT, Hindustan Insecticides Ltd., FCI complex, etc.

Suggested Readings:

1. Ishaaya, I., & Degheele, (Eds.). (1998). *Insecticides with Novel Modes of Action.* Narosa Publication. House.
2. Matsumura, F. (1985). *Toxicology of Insecticides*. Plenum Press.
3. Perry, A.S., Yamamoto, I., Ishaaya, I., &Perry, R. (1998). *Insecticides in Agriculture and Environment.* Narosa Publication. House.
4. Prakash, A., & Rao, J. (1997). *Botanical Pesticides in Agriculture.* Lewis Publication.

Additional Readings:

1. Greim, H., & Snyder, R. (ed)., (2018). *Toxicology and Risk Assessment: A Comprehensive Introduction.* John Wiley and Sons.
2. Whitford, F. (2002). *The Complete Book of Pesticide Management.* Wiley Interscience, John Wiley and Sons.
3. Chattopadhyay, S.B. (1985). *Principles and Procedures of Plant Protection.* Oxford & IBH.
4. Gupta, H. C. L. (1999). *Insecticides: Toxicology and Uses.* Agrotech. Publication.

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